REPORT OF THE ADVISORY COMMISSION UPON DIFFERENTIAL RATES.

PRELIMINARY.

In January, 1882, the undersigned were notified that they had been selected by the New York Central & Hudson River Railroad Company, W. H. Vanderbilt, President; the New York, Lake Erie & Western Railroad Company, H. J. Jewett, President; the Pennsylvania Railroad Company, G. B. Roberts, President, and the Baltimore & Ohio Railroad Company, John W. Garrett, President, to act as an Advisory Commission upon "the differences in rates that should exist, both eastwardly and westwardly upon all classes of freights between the several terminal Atlantic ports," and to report upon the same.

Accepting the appointment, the undersigned met and organized as a Commission, at the City of New York, on February 13, 1882, by designating Mr. Thurman to act as Chairman, and selecting Mr. Thomas C. Moore, of Indianapolis, as Secretary. On conferring with Mr. Albert Fink, who on that occasion represented the several railroads named, we were informed that it was not the purpose or desire of the railroad managers to take part in the proposed inquiry after setting it on foot; but that they proposed to leave it exclusively in our hands, in the expectation, however, that other parties interested in the problems of railroad transportation would make before us a full showing of the facts supposed to have a bearing upon the question, and that we would then express our opinion, uninfluenced by the wishes or interests of the railroad companies. The managers informed us, however, that they held themselves ready to furnish any such information as might be peculiarly within their knowledge, at any time when we might call for it.

Having this understanding of our commission, and desirous of acting intelligently, and with full information, we caused circulars to be sent to all the commercial organizations of the cities of New York, Philadelphia, Baltimore, and Boston, and to such like organizations in the interior as it was thought would be inclined to respond, inviting them to appear before the Commission and present their views; and whenever a desire to be heard was expressed by any one of them, time and place were designated for the purpose.

From the Produce Exchange, the Board of Trade and Transportation, and the Chamber of Commerce of the City of New York, and from the corresponding organizations of the cities of Philadelphia and Baltimore, letters expressive of a desire to be heard were received, and public meetings were accordingly held in those cities, at which the question referred to us was very fully considered and discussed. For the purposes of such discussion, we found that in every instances careful and thoughtful preparation had been made, and the arguments, either in full or in substance, were put in print for our subsequent review. Statistics were also collected for us, so far as was thought important. Under the guidance of the commercial bodies, we also visited and inspected the railroad terminal facilities, under circumstances most favorable to a full understanding of the manner in which they concerned the general subject.

The leading commercial organizations of St. Louis, Louisville and Toledo also appeared before us at public sittings held in those cities respectively, and presented their views in print, supplementing them with oral arguments and explanations.

We were also favored at Philadelphia with discussions by representatives of the Board of Trade of Newark, New Jersey, and at St. Louis with the views of the Board of Trade of Indianapolis, presented by one of its members. The Chamber of Commerce of Cincinnati communicated its views to us in formal resolutions, without deeming it necessary to request public sittings in that city, and single individuals, not representing any formal organizations, have also in some cases been heard. We also sought and obtained information independently wherever we have found it available, and have made use of the published reports of the railroad companies for that purpose. Our endeavor has been to view the subject from the standpoints of the various interests concerned, and to reach a conclusion that overlooked the just claims of no interest and no locality.

THE QUESTION.

The subject referred to us is that commonly spoken of under the designation of "differential rates." In the reference, however, and in the paper which follows, the term is made use of in a somewhat restricted sense, being applied not to the differences in rates generally, or as between the several classes of freight as they are arranged in the tariffs of freight charges, but to the differences in rates which are made by the railroad companies as between the several Atlantic seaport cities, and the interior points where the freights are taken up or delivered. It appears that the four railroad companies mentioned, and which, with the Grand Trunk of Canada, are commonly called the trunk-line roads, have generally been accustomed to make higher charges for the transportation of freights between New York and Boston, an eastern *termini*, and the leading towns of the interior, than between Philadelphia and Baltimore and the like towns; and that at the present time they seem to agree in the policy and propriety of making these differences. An idea of the extent of the differences is indicated by the statement that, taking the charges for the transportation of eastward bound freights from Chicago to New York as the standard, the charges to Boston are made the same, and those to Philadelphia two cents, and too Baltimore three cents per 100 lbs. less. On westward bound freights the differences are not uniform, but are made higher in the case of those classes of property which are rated highest in the freight tariffs. As between the seaboard cities and St. Louis, Cincinnati, Toledo and other Western towns, the rates are proportioned to the Chicago rate according to mileage. This is the existing rule or practice.

Whether it is right or proper to make any such discrimination in the charges for the transportation of property between the Atlantic cities and the cities of the interior, and if so, to what extent, is the question that we understand was referred to us, and nothing more. We, therefore, limit our discussion to that question, and pass by many subjects of interest in railroad transportation that were more or less touched upon in the public discussions which took place in our hearing, but which can interest us only as private citizens. Whatever opinions we or any of us may have respecting controverted questions in railroad policy and railroad management, which do not fall within the scope of our present inquiry, it would not become us to intrude them into this discussion.

THE PARTIES CONCERNED.

Although the invitation to us came from the trunk-line railroad companies, we have not understood that this was because the subject was one over which they had rightfully any exclusive authority. It is, indeed, a subject with which they, first of all, are called upon to deal, for they and their affiliated roads enforce the charges which come under consideration, and establish the differentials if any are established at all. But the railroads constitute a single class only of the many whose interests may be effected, and it may appear, perhaps, that they are not the class most largely concerned. In all the discussions before us it has been assumed that the people of Boston, New York, Philadelphia and Baltimore, and especially all those who are engaged in the exchange of commodities with the interior and with foreign countries, are largely interested, and that their prosperity is to some extent involved in the relative adjustment of rates. The railroads of the interior, which act as feeders to the trunk lines, and divide with them the charges on freights moved between the interior and the seaboard, are also interested to the extent that the differentials affect their proportion of the charges. We have found also that the people of the interior consider their interests to some extent involved in the question; and they certainly are concerned in having such tariffs of charges upon the roads over which their traffic is conducted as will give them the advantages of any and all the Atlantic markets, without subjecting their dealings with any one of them to unfair conditions or burdens. It is therefore evident that the question is one of very general interest; and it may almost be said that the question of relative equality of rates, as between Chicago and the Atlantic ports, when those between the other Western towns and the same ports are measured by them, is one of national rather than of local concern.

THE SITUATION.

Three distinct views of the differential rates were taken and urged before us, which may be shortly stated as follows: The New York view that the differences made in the rates in favor of Baltimore and Philadelphia were wholly wrong, and should be abrogated; the Baltimore view that the differentials were right in principle, but if anything too small; the Pennsylvania view that the differentials should continue, but that they ought not to discriminate as between Philadelphia and Baltimore. In the interior we encountered much difference in opinion, but no views distinctively peculiar.

The discussion was opened at New York, where it seemed to be assumed that the parties chiefly concerned were the three cities of New York, Philadelphia and Baltimore, and that the differentials operated to build up the business of the last two to the prejudice of that of New York. On this assumption it was then said they were unjust, and that it was the duty of the New York railroads to force their abrogation. It was also assumed that two of the trunk line railroads were peculiarly New York roads, whose managers ought to be expected to labor especially in the New York interest, and to enter into the rivalries of that city, so far at least as might be necessary to protect the commerce of New York against injury through the more favorable rates which might be offered by the Philadelphia and Baltimore roads to the people of those cities respectively. At Philadelphia a somewhat similar view was taken of the obligation of the Pennsylvania Railroad to protect Philadelphia interests, and at Baltimore a corresponding protection appeared to be looked for at the hands of the Baltimore & Ohio Railroad. Thus the several trunk-line railroads were spoken of as New York, Philadelphia and Baltimore roads respectively, and claims of a local nature were made upon them as being such roads.

Nothing, however, in our investigation of the subject has struck us more forcibly than the fact that the growth of railroad business has been such as to take from the several trunk-line roads nearly all of purely local character which they formerly possessed. The time appears to have gone by when the interests of any one of them can be concentrated upon and bound up indissolubly with the interests of any one city, so as to constitute it either the dependent or the champion of that city as against the rest of the Union, or even as against any other commercial center of the Union. The arms of every one of these roads reach out in every direction to embrace and gather in the business of the country, and to distribute impartially according to need and demand. States and cities have called particular railroads into being, but they cannot circumscribe their operations, or make exclusive appropriation of their benefits. Once constructed, they belong to a public which pays little regard in business matters to State lines; and business reasons, which have general influence and force, control their operations, in spite of local sympathies or desires. It is true that two of the trunk-line railroads—the New York Central & Hudson River and the New York, Lake Erie & Western—hereinafter spoken of as the Central and the Erie respectively—find the largest share of what is called their through business directed to or originating at the city of New York, and it may be that their managers desire to bring to that city all the business they can control. In common parlance, there is certainly nothing misleading in speaking of these two as New York roads; for the major part of their interests center in New York, and whatever benefits or injures the business of New York, must, to some extent, benefit or injure them also. But these roads do not refuse freights to Baltimore, Philadelphia, or Boston; on the contrary, they enter into competition for them, and through the assistance of affiliated roads, endeavor to make it for the interest of the people of those cities to avail themselves of their facilities in the transportation of goods and supplies. They thus make themselves part of a system of competitive roads, which offers to the business community of every Atlantic seaport a choice of traffic routes and traffic agencies, and they solicit business on the necessary understanding that they shall respect the just rights and claims of all localities, and not sacrifice to New York the interests which are confided to them elsewhere.

It is also not misleading to speak of the Baltimore & Ohio Railroad as a Baltimore road, for its interest, in the main, center in the city of Baltimore; its bonds and stocks are supposed to be mainly held or controlled there, and its traffic is mainly between that city and the interior. But this road, no more than the New York roads, consents to stand apart from the railroad system of the country, as a road limiting its business to a single Atlantic terminus, and declining general competition. On the contrary, it solicits business at the seaport to the north of Baltimore; and that its efforts in that direction have a fair measure of success is evidenced by the fact that in the year 1880, it carried, of the westward-bound freight moved by the trunk line roads from New York, more than eight per cent., from Philadelphia more than nine per cent., and from Boston about five per cent., and these proportions are fairly representative of the general run of its traffic. These facts are sufficient to show that neither the New York roads nor the Baltimore road are so exclusively linked to the business interests of those cities respectively, as to be either unable or unwilling to share in or contribute to the prosperity of rival cities. And it is now publicly said, and seems to be understood, that the Baltimore & Ohio is seeking to obtain an independent line into New York, that it may make its competition at that point still more active and efficient.

It certainly cannot be claimed, with much appearance of plausibility, that the Pennsylvania Railroad is the road of any particular city. The company which owns it is indeed a Pennsylvania corporation, its offices are in the city of Philadelphia, its stocks and bonds are largely held there, and perhaps not largely held elsewhere in this country, and it is not improbable that the feelings and sympathies of those who manage its concerns would incline them to desire specially the growth and prosperity of Philadelphia above other places. But the road has its eastern terminus, not in Philadelphia, but on the harbor of New York, where it has made large and costly preparations to compete with the Central and Erie for New York business. That it does compete with those roads suc-

cessfully is shown by the enormous amount of freight which it moves from and carries into that city, and by the fact that the merchants of New York have come to look upon it, with entire justice, as one of their most important channels of communication with the west. In the year 1880 this road took out of New York 26 per cent. of the west-bound freight carried by the trunk roads, and delivered to it nearly 20 per cent. of the east-bound. While thus successfully bidding for the custom and favor of New York, it is plain that the Pennsylvania Railroad cannot antagonize the interests of New York unfairly, and must refrain from any attempt to subordinate them to the rival interests which it also endeavors to serve. It is a necessary condition of its competition for the trade of New York, that it shall make its services beneficial, and that it shall offer facilities which are not surpassed by those offered by other roads. But the Pennsylvania also, through its association with the Northern Central, competes with marked success for the trade of Baltimore, and took away from that city in the year 1880 23 per cent. of the west-bound freight carried by the American trunk line roads. Its share in the east-bound freight was still more considerable, being 40 per cent. What is said of its relations to New York business may therefore with equal truth be said of its relations to the business of Baltimore, it must hold itself above the rivalries of locality, and assume the attitude of an impartial carrier, desirous of the favor and custom of the whole country, and willing and anxious to serve all localities on such terms as are relatively equal and substantially just.

It is not likely that this reaching out of all the trunk line roads to compete with each other in the several Atlantic cities was contemplated when the roads were originally constructed; but as the several lines have pushed their connections in the West in competition, it has been found desirable for each to offer to its patrons the advantages of as many markets as possible, and to carry for them, without breaking bulk, whatever they have had for carriage in an eastward or westward direction. Competition has thus made roads national which were once local, and it is vain to expect that so important a subject as that of differential rates will be settled on the local preferences or prejudices of those who may have authority in railroad circles. It must, therefore, be settled either arbitrarily, by the fiat or agreement of the transportation companies, or it must be determined by some underlying principle. We agree with what was said at the New York discussions and elsewhere, that any arbitrary adjustments in disregard of such principles as would naturally influence prices of transportation when untrammelled, would not, could not and ought not to be upheld. There should be—and as we think there must be—some principle by which to determine such a question, or perhaps two or more principles acting upon and qualifying each other.

It has been assumed in the discussions we have listened to, that business would be invited to a city by low rates upon its railroad lines, and that the prosperity of the city would bear some relation to these rates. How far this assumption is likely to be well founded, we, of course, have no more means of judging than has the general public. But the fact that each of the trunk-line roads has its relations to all the cities, and each city recives benefits from all the roads, is sufficient to suggest some question, whether low relative rates and large relative business will necessarily go together. Though it is true, as we think and have said, that all the roads which compete for the business of a place must treat its interests fairly, and not subordinate them to the interests of rival places; yet it must be expected that they will at all times have primarily in view their own interests, and that their zeal to procure business will bear some proportion to the anticipated profits. If New York business is most remunerative, it will be sought most eagerly; if not, the railroad managers will direct attention to that which is. Reducing the New York rates relatively to those of Philadelphia and Baltimore seems, therefore, to invite the roads to favor particularly the business of the two cities last named. Establishing differential rates in favor of Philadelphia and Baltimore holds out inducements to the railroads to favor the New York trade. The Pennsylvania Company may be expected to desire to carry freights past Philadelphia to New York if it can be paid for the additional haul, but to prefer to leave them in Philadelphia, if for the considerable distance from there to New York it will be paid nothing for the transportation. Thus what each city asks, appears to have some tendency to enlist the selfish interests of the railroad companies against it. We mention this among other circumstances affecting the question, without deeming it necessary to remark upon it further.

THE PRINCIPLES THAT SHOULD CONTROL.

It seemed to be taken for granted, in the arguments presented to us, that the existing differentials had not been determined on any principle, but that they were the result of a compromise between the railroad companies, whereby they had purchased peace between themselves. Three different principles, however, were suggested by different parties, as those which should control, and these found advocates in different localities, according as, it was thought, those localities would be favored by their operation respectively. These three principles may be designated respectively: the distance principle, the cost principle, and the competitive principle. It is, however, proper to say that those who advocated the first and the second of these principles generally agreed that the third should not be discarded; but that it had its legitimate place, and must have its legitimate influence also. Brief notice will be taken of these three principles respectively.

THE DISTANCE PRINCIPLE.

It was contended by the commercial representatives of Philadelphia and Baltimore, that freight charges on like classes of freights between the interior and the seaboard cities ought to be proportioned to distance. We understood them to mean by this that the shortest line from Chicago to each of the Atlantic cities should be taken as the standard for measuring the freight charges between Chicago and that city, and that the charges for all the cities should then be determined by the mileage. By referring to the accompanying note, it will be seen that if the mileage standard were adopted, the freight charges between New York and Chicago would be about 10 per cent. greater than those between Philadelphia and Chicago, and about 10 per cent. more than those between Baltimore and Chicago. Those between New York and Cincinnati would be about 28 per cent. more than between Philadelphia and Cincinnati, and about 38 per cent. more than between Baltimore and Cincinnati.* According to the average rates on grain and provisions this year, the differentials have only been about 6⅔ per cent. in favor of Philadelphia, 10 per cent. in favor of Baltimore, and the distance principle would, therefore, on an average, increase them greatly. It was urged, therefore, that it was by this principle that the several roads constituting a competing line are accustomed to apportion their joint charges, and that these very trunk lines adopt it in dividing the charges upon through freights with the roads from which they receive the freight, or to which they deliver it. The New York representatives, on the other hand, conteuded that the distance principle could not with any justice control, for the reason that distance does not measure either the cost or the value of the service; so that if adopted as the standard of charges, it would be an arbitrary standard, and the element of equity in the rates would be disregarded.

If there were between each of the Atlantic cities and the interior towns only a single line of railroad communication, some of the difficulties in the way of the application of the distance principle, which are now obvious, would be wanting. But, as has been said already, every one of those cities has several lines, and would be content with no less. The supposed distance principle ignores this fact: selecting the shortest line to each city, to the disregard of the rest, and estimating the charges in proportion to its length. It might thus happen that the charges on freights from Chicago to the several seaboard cities, with all their roads taken into the account, would bear no proportion whatever to the distance; and it is certain that as between the roads serving the same city, the supposed principle could not be applied at all, for they, irrespective of distance, must conform to the lowest rates. The distance apportionment would, therefore, not be an apportionment of principle, but only of expediency; and whether expedient or not, must depend somewhat on other considerations, which present themselves in the practical administration of railroad affairs.

It cannot be said, however, that distance is a circumstance without value in the determination of railroad tariffs; it is, on the other hand, one of much importance. Nearness to the producers and consumers of the articles which it handles is a great advantage to any city; and so far as the rivals of New York are possessed of this advantage, they are justified in expecting that it will be recognized. But the value of this advantage is a question that must be determined with many other things taken into the account, and can only be fully solved in the tests of competition. The general fact now is, that distance does not determine railroad charges, and that where competition is most active it influences them the least. The distance principle does not, therefore, stand the test of competition, and so far as we can percieve, there is no possibility of establishing it except by subordinating competition altogether to it. But to do this would require an exercise of arbitrary authority which we do not understand those who advocate the distance principle to advise or desire. We must conclude, therefore, that distance cannot supply for us the controlling principle, and that its proper influence upon transportation charges cannot be determined either arbitrarily or as a matter of antecedent computation or estimate.

* DISTANCES VIA THE SHORTEST RAIL ROUTES TO

	Boston.	New York.	Phila.	Baltimore.
Chicago	1,009	900	823	802
Burlington, Ia	1,216	1,106	1,030	995
Cincinnati	927	743	667	576
Columbus, O	807	623	547	512
Cleveland	671	580	504	483
Detroit	724	673	682	661
Indianapolis	951	810	735	700
Kansas City	1,487	1,324	1,248	1,192
Louisville	1,161	870	794	706
Memphis	1,438	1,247	1,171	1,083
Milwaukee	998	947	908	887
Omaha	1,503	1,393	1,317	1,294
St. Louis	1,212	1,050	973	917
St. Paul	1,418	1,308	1,232	1,211
St. Joseph	1,478	1,356	1,280	1,223
Toledo	784	693	617	596

Taking Boston as the standard, New York averages 12 per cent. nearer to these towns, Philadelphia 18 and Baltimore 22 per cent. nearer.

Between New York and Chicago the line of the Pennsylvania Railroad is 47 miles shorter than that by the Erie and its connections, 50 miles shorter than that by the New York Central and its connections, and 114 miles shorter than that by the Baltimore & Ohio and its connections.

THE COST PRINCIPLE.

New York parties who rejected the distance principle were inclined to favor the grading of rates by the cost of service; and if this were done, they claimed that the differentials would disappear altogether. Cost of service is here employed as synonymous with the phrase cost of moving freight, which is most commonly used. The latter phrase, however, is used in two very different senses, which it may be important to distinguish, in order to avoid misconception. Railroad companies use the phrase for their own purposes when making reports to their stockholders or for the public under the requirements of state laws. In such reports cost of moving freight will be understood to be the actual outlay by the railroad company in moving its freight over a completed and equipped road. This outlay will embrace the cost of fuel, the compensation to the regular freight agents, to freight solicitors, if any, to the servants employed to handle the freight and govern and move the trains. It must also embrace the necessary expense of keeping good the freight equipment, and it should include a fair proportion of all such expenses of the company as are incurred for the freight and passenger traffic in common, such as repairs of track, taxes, official salaries, legal expenses, office expenses, general advertising, etc. To all these must be added the cost of insurance against losses to freight and freight equipment by casualties of all descriptions, or of making good such losses. If all these items are added together, and the sum total is divided by the number of tons of freight moved one mile upon the road, we have as the result the average cost of transporting a ton of freight for one mile of distance.

The report which gives these items will also give others that, as between the railroad company and its patrons, must be understood as constituting a part of the cost of service. If the company owes debts, the interest paid upon these should be included; if it has made dividends to its stockholders, the amount should be included also. Indeed, it is generally conceded that the cost of service should rightfully and equitably be made to include a fair return in interest or dividends on the cost of the railroad investment; though as to what return is fair and reasonable, differences in opinion are held and expressed. But for our present purposes it is sufficient to leave any such differences out of view, and to speak in general terms of the cost principle as that which would measure the railroad charges by the cost of service, and which would make the cost of service embrace the actual outlay of the railroad company as above explained, and a fair return in interest or dividends on the cost of the road and its equipment.

To show that the cost principle would be to the advantage of New York, it became necessary to show that the cost of transporting freight between New York and Chicago was, or ought to be, less than the cost between Philadelphia and Chicago, or Baltimore and Chicago, or at least that it was not greater. But upon this point, unfortunately, the information that was produced before us did not appear to be very precise or very accurate. The expressions of opinion were, indeed, clear and strong, but they were generally supported by argument and inference rather than by evidence. Our attention was not directed to official reports or figures, where or by which the actual cost was set forth, but rather to the topographical features of the country between New York and the head of Lake Michigan, which, it was said, offered admirable facilities for the construction of railroads, which would be economical in original outlay, and economical also in their operation. No such economical road, it was said, had been or could be constructed further to the south, and the unfavorable gradients and curvatures on the Pennsylvania and the Baltimore & Ohio roads more than deprive them of all the advantages which they possess in shorter distance. It was also urged that another important circumstance should be taken into the account when the cost is being estimated. By far the larger portion of all the freight carried by the trunk lines is east-

ward bound. When cost is considered, the probability of return freights must be taken into the account, since to whatever extent the cars which convey freight to the seaboard must be returned without loading, the cost of the return must be reckoned as part of the cost of transporting the east-bound freight. And it was confidently asserted that the probability of obtaining remunerative return freights was much greater at New York than elsewhere on the Atlantic coast.

To make out the case of more favorable lines and gradients between Chicago and New York, the route is required, after it leaves the shore of Lake Erie, to follow substantially the course of the Erie Canal to the Hudson, and thence down that river. By that route a road has been constructed with few unfavorable grades and curves, and this road no doubt is or can be operated with much greater economy than would be possible if its line were through a mountainous region. But if we take this as the route for the freight transportation between New York and the interior, and compare it with the routes to Philadelphia and Baltimore over the roads which carry most freights to those cities respectively, we commit the mistake of directing our attention exclusively to the one road which possesses this favorable line, and ignoring altogether the fact that New York has other roads which it is desirable for its interest should live and prosper, and that over each of them the active and energetic merchants and manufacturers of that city are seeking the business of the interior and inviting its custom. Every one of those roads brings to New York a large amount of trade which would not be obtained without its facilities; and it seems certain that New York cannot afford to ignore any one road, any more when it is settling its grievances with rivals than when estimating advantages over them. If, therefore, it be demonstrated that the New York Central and its connecting roads can transport western products from the interior to New York as cheaply as the more southern roads can move them to Baltimore or Philadelphia, it may not follow that the interest of New York would be subserved by the adoption of the cost principle and the bringing of the charges on freight transportation to and from New York to the test of what the Central could afford. Prudence would require that at least the probable consequences should be considered: and if among these consequences should be the possibility of some other line to New York being found unable to endure the test of the cost principle, this of itself ought to raise some doubt whether the city of New York could be interested in establishing it. Now the very claim that is made in behalf of the New York Central route, as one of remarkable economy, assumes that the Pennsylvania route is less economical; and the assertion that the Central can carry from Chicago to New York as cheaply as the Pennsylvania can carry from Chicago to Philadelphia, contains within it—since the less is contained in the greater—that the Central can carry from Chicago to New York cheaper than the Pennsylvania, which only reaches New York by carrying past Philadelphia, can possible do. The application of the cost principle, if made under such circumstances, must force the Pennsylvania to this alternative: that it must carry at rates which will not give to the company a fair return in profits, or it must give up competition for New York business; and the Erie, whose line is also assumed to be less favorable than that of the Central, might be compelled to face the same alternative. It probably would not be contended that either the Grand Trunk or the Baltimore & Ohio, whose lines to New York, through connecting roads, are so much longer than those of the Pennsylvania, could compete at all for New York business under a strict application of the cost principle. The natural tendency of its application would, therefore, be in the direction of throwing upon one of the existing lines to New York the bulk of the New York business, to the destruction of the others, and to the final destruction of competition. It is not to be assumed that this is what New York desires. Every great city finds it conducive to its prosperity to secure as many of these avenues of trade and travel as possible; and it is certainly not more important to gain a new line than to preserve one already in existence, and already equipped with all those powers of usefulness which a new project can only promise at some time in the future. If, therefore, the cost of principle were to be adopted for regulating the charges as between the competing cities, it would seem that New York ought to bring into the calculation not one road only, and that the one most economical in construction and operation, but all the roads which contribute to its prosperity, and which it desires to retain.

At Philadelphia and Baltimore it is asserted with great confidence that over no one of the New York roads can freights be conveyed as cheaply from Chicago to New York as they can be over the Pennsylvania and the Baltimore & Ohio roads to Philadelphia and Baltimore respectively. For this confidence certain facts are stated which are supposed to be sufficient to produce the result, and official reports are cited as evidence that the result has followed. The favorable lines of the New York Central, and its affiliating roads, are admitted; but it is contended that all the advantage of these is more than neutralized by greater distance and the greater cost of fuel to the New York roads over those to the south of them. The Pennsylvania and the Baltimore & Ohio roads find the coal, which represents the motive power, in beds at various points on their lines, and can take it up for use at little more that the cost of handling: while the New York roads, on the other hand, and specially the Central, must transport the coal for a long distance at a cost two or three times as great. This cost constitutes a very considerable part of the total expense of moving freight, and it cannot be overlooked or treated as of little moment.

The official figures to which attention was called to show the greater cost on the New York line are to be found in the reports of the New York Central, the Erie and the Pennsylvania, made by the directors to the stockholders, to show the operation of the roads for the years 1880 and 1881. In those reports estimates are made of the cost to the companies respectively of moving one ton of freight for one mile of distance, omitting from the calculation the items of interest and profits. The reports, as will be seen on referring to the note in the margin, make a very unfavorable showing;* and if the figures told the whole story, and if we could be assured that they were made by each company on the same basis, they would go very far toward justifying the other cities in the claims they make. But unfortunately, these reports are, for our purpose, of little value. They cover too much in some respects, and too little in others, to give us the information we need. 1. The trunk-line companies report the cost over their own roads only, and do not include the cost over the feeder roads; but what we need to know is the cost of transportation over the whole line from western points to the seaboard. 2. The companies in their reports do not discriminate between the cost of transporting local freight and through freight, but endeavor only to give the average cost of moving both. But here the reports embrace too much for our purposes, for on this inquiry we are interested only in the cost of moving through freight. If the freights over all the roads were similar in kind, and if the proportion of through freight to way freight were nearly the same on all, the report of average cost might be accepted as indicating the proportionate cost to each road of its through freights. But we must take notice of the fact, which is matter of common knowledge, that the character of local freight is exceedingly diverse on the different roads, and that the cost of handling is far from being uniform. If one company, for example, handles coal in large quantitiee as way freight, loading a train completely at on station, and moving it to another for complete unloading, the cost of such business would furnish very unsafe and unreliable means of comparison with that of the local freight of miscellaneous articles, which another road might pick up in small quantities at many way stations, and deliver at as many more. But these railroad companies, unfortunately, have as yet agreed upon no uniform method of keeping accounts, whereby they may determine, by the same standards, the actual outlay of the roads in moving their freights. It would seem that there ought to be no differences in this particular; but the official reports some, times disclose on examination that the diversities are very considerable, and are not infrequently met with in the accounts of the same company. One company, for example, when it is able to make such betterments as station houses, warehouses and side tracks from its current receipts without increasing its indebtedness, may charge the cost to operating expenses, while another under similar circumstances would charge them to construction account, and still another would include them in operating expenses for time being, and at the end of several years perhaps transfer them to construction account for the purposes of a new issue of stock. Evidences of these different methods of procedure appeared in reports of different companies, which were made use of for their information, or for the purposes of illustration before us. It is no doubt undesirable that there should be this diversity in practice; but while it exists it is necessary to take notice of it. If concert of action among railroad managers could bring about a uniform system of accounts, so that the official reports based upon them, which are made periodically for the information of shareholders, might give valuable and reliable information and means of accurate comparison to the public as well, the change in methods would be likely to prevent many misconceptions and misconstructions of corporate action which now arise in the public mind, and which lead to both public and corporate annoyances.

For all the reasons assigned, we are without reliable information by which to apply the cost principle in the regulation of charges of transportation between the Atlantic cities and the interior, and we cannot say that the application would be to the advantage of New York. *Prima facie* the case seems to be against New York, especially when the Pennsylvania Railroad, which constitutes one of its most important lines, is taken into the account. It is very manifest that that railroad can leave freights at Philadelphia more cheaply than it can transport them the additional 87 miles to New York, and probably it can deliver them for still less at Baltimore, since the unfavorable grades of the road, to which much importance was attached in the New York arguments, are all passed before Harrisburg is reached, and from that point the line made use of by the Pennsylvania to reach Baltimore is shorter than the line to Philadelphia.

The favorable influence which the concentration of foreign commerce at New York ought to have upon railroad rates between that city and the interior, may perhaps be something, for freight tariffs ought to be, and will be, arranged with regard to the probability of compensating freights in both directions. When a railroad company can have freights in one direction only, and must return its cars empty, it must necessarily make the freights pay for the cost of the return. In the eastern and western transportation we have an illustration of this state of things. It is a matter of familiar knowledge that much the largest proportion of freight is eastward-bound, and that large numbers of unloaded cars are constantly being sent west over all the roads. If the course of trade were such, that any one of the Atlantic cities sent out by rail as much freight as it received, its advantage over the others would be obviously very great. Railroad companies could afford to make much better rates upon all freights bound to the city from which they were certain of compensating return loads. It is proper, therefore, that railroad companies should take into consideration the condition of things in this regard, and every participant in foreign commerce has a right to expect that this will be done. We have therefore directed our own attention to the differences in the freights received and those sent out by the four leading Atlantic seaboard cities over the four American trunk lines, and have given in a marginal note the aggregates for the year 1880, which will be sufficient for the purposes of approximate comparison.* The table shows that the proportion of freight sent out from New York over these roads, when compared with that which is received from them, is considerably greater than the proportion at either Baltimore or Philadelphia, but it is nevertheless only as one to four and a quarter, and it is manifest that not only must a large proportion of all the cars which go loaded to New York return without loads, but that a much more considerable number must so return from New York than from either of the other cities.

While, therefore, New York has an advantage over its rivals, in the larger proportion of west-bound to east-bound freight, the advantage, if estimated by the bulk, is not very great. And it must be borne in mind that these four cities do not by any means furnish to the roads all their west-bound freight, but that they take large quantities from other towns along their line. It may be that New York west-bound freights average highest in the freight tariffs, but even then the relative advantage of New York will probably be less considerable than some of its advocates have supposed. And on careful examination of all the arguments advanced at New York, we are not satisfied that a strict application of the cost principle, if it should be found susceptible of application, would be likely to benefit the trade of that city in its rivalry with the other Atlantic cities.

But if the exact cost of transporting freight by rail were attainable, could it be made the standard whereby to measure the charges as between competing cities? We do not consider now what might be just and right as between a railroad company and its patrons if the case of any railroad company could be taken up and considered by itself apart from all others, but of what is practicable in view of existing facts. If the cost principle could be applied, we do not see how the railroad companies of the country could justly complain of it. If they could all receive for the

Continued on page 274.

* Cost of moving freight per ton for one mile at distance:

	1880. Mills.	1881. Mills.
On the New York Central	5.41	5.62
On the Erie	5.54	5.39
On the Pennsylvania	4.74	4.37

No corresponding figures are given in the reports of the Baltimore & Ohio R. R. Co.

* Freight tonnage by the four American trunk line roads for the year 1880.

	Received.	Sent.
New York	4,266,830	1,022,612
Boston	913,887	309,232
Philadelphia	1,553,381	299,474
Baltimore	1,559,251	241,090

As the business with the Grand Trunk of Canada is not covered by this statement, it will be readily understood that the statement is not so favorable to Boston as it should be, as its business with the Grand Trunk is very large.

ENGINEERING NEWS
AND
AMERICAN CONTRACT JOURNAL.

Tribune Building, New York City.

GEO. H. FROST.....EDITOR AND PROPRIETOR.
S. D. V. BURR.....ASSOCIATE EDITOR.

SATURDAY, AUGUST 5, 1882.

EDITORIAL ANNOUNCEMENTS.

Terms of Subscription.—To the United States and Canada, $4 per annum, including postage; all parts of Europe, $5, payable in advance. Remittances at the risk of the subscriber, unless made by registered letter or by draft, check or P. O. order, payable to GEO. H. FROST.

Terms of Advertising.—One inch, 12 lines, one insertion, $2; one month, $6.50; three months, $17; six months, $30; one year, $50. Special rate for large space and long time will be given on application. Advertisements inserted for less than three months, payable in advance; for longer time, payable quarterly.

Articles for Publication in the current number should be received at the office of publication not later than Thursday morning, and advertisements not later than Friday noon.

Correspondence upon subjects which naturally belongs to the province of this journal is solicited.

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NOTICES OF MEETINGS.

AMERICAN INSTITUTE OF MINING ENGINEERS.

COLORADO MEETING.

Programme.

Saturday, Aug. 19—In Denver. A brief preliminary evening meeting, at which the Institute will be received by the citizens of Denver.

Monday, Aug. 21—Visit to Black Hawk and Central, with an evening session at Central City.

Tuesday, Aug. 22—Georgetown. Idaho Springs. Return to Denver in the evening.

Wednesday, Aug. 23—Leadville, going over the South Park Railroad. Evening session.

Thursday, Aug. 24—Excursions to the Leadville mines.

Friday, Aug. 25—Excursions to the Leadville smelting works, reaching Pueblo at night.

Saturday, Aug. 26—Pueblo Iron and Steel Works, and Mather & Geist's Smelting Works. Colorado Springs and Manitou in the evening.

Sunday, Aug. 27—Colorado Springs and Manitou.

Monday, Aug. 28—Return to Denver. Evening reception.

Tuesday, Aug. 29—Argo Smelting Works. Golden and its smelting works. Subscription dinner.

Besides these excursions, facilities will be afforded those who desire to see the iron and coal mines of Colorado. And for those who can extend their visit, an excursion to the San Juan district will be organized.

Arrangements are being made with the railroad companies for reduced rates to members of the Institute and ladies accompanying them. When concluded, a circular will be issued informing members of the expenses from different points to Denver and return. These rates will probably not exceed two-thirds the regular rates, or about $60, plus Pullman car special rates, from New York to Denver and return. Special facilities are courteously offered by the roads in Colorado for the excursions of the Institute.

Persons proposed for membership have the same privileges as members with regard to the meeting and excursions.

As usual at the meetings of the Institute, ladies are expected to be present. Seventy-seven members with forty-three ladies have already signified their intention of being present at the Colorado Meeting, and it is expected that the attendance will greatly exceed these numbers.

The unusual attractions offered by the mining regions of Colorado are increased at this time by those of the Denver Exposition of mining appliances, minerals, etc., and by the unusual facilities offered for examining mines and works, and acquiring information concerning them.

The representatives of several foreign kindred societies are expected to be present.

Members who purpose attending this most interesting meeting should at once write the secretary of the Institute, who has to notify the railroad companies of the number of tickets required, and the names of those entitled to the special rates offered. They are also requested to inform the secretary promptly of their intention to read papers at the meeting.

Prof. W. I. Marshall, who is well known by his lectures on the wonders of the Geyser Country, offers to conduct a party of not less than eight, nor more than twenty-five, through the Yellowstone National Park. This trip would occupy from twenty-six to twenty-nine days from Denver to and through the Park and back to Denver. The greater part of this time would be spent "camping out" in the Park. The expenses of this round trip are estimated at from $275 to $300 for each person. Full information concerning this trip may be obtained from Prof. W. I. Marshall, Fitchburg, Mass.

R. P. ROTHWELL, President,
27 Park Place, New York City.

T. M. DROWN, Secretary,
Easton, Penn.

THE SAINT GOTHARD.

While *fêtes* on the one hand and a dispute at the very banquet table between Swiss, Italians and Germans on the other, combined to render the opening of the Gothard Tunnel an event from even a social point of view, it is now seen that this work has presented extraordinary engineering difficulties. These have been overcome, but the practical working of such an immense tunnel has not yet been sufficiently long in progress. The principal contractor, Favre, is dead, but his estate has lost seven million francs. Almost all the engineers worked for very small remuneration, and are now depending on the sense of justice of the German and Italian Governments.

The principal tunnel is 14,944 metres in length, but it is preceded and followed by fifty-three other tunnels, which bring up the distance perforated to 40,718 metres, or fully twenty-five English miles.

The situation of the St. Gothard, in the very basis of the Rhine, Rhone, Reusse, &c., with the Lake of Lucerne on one side and the beautiful Italian lakes on the other, has naturally given a very diversified geological character to the mountain and surrounding country. Gneiss, especially, was met in immense masses and of various kinds, as hornblend, &c. Micaceous schist and lime formed in many places the mountain slopes.

The grades were, of course, a matter of great difficulty, but 27, 26 and 25 per cent were adopted on the mountain road and 10 per cent in the valleys. The maximum curve radius was 300 metres, but the stations are always so arranged that trains can enter on straight tracks. The line is also, where necessary, arranged for a double track, but not so in the valleys.

To guard against avalanches, rolling masses of rock and mountain torrents, provided other problems for the engineers. Galleries, bridges and dams have been built, but much yet remains to be done. The normal width of way is 4 metres in the valley and 4·20 metres on the mountain road. The walls of rock cuttings were made vertical when possible, but otherwise given a suitable inclination. In rolling ground the proportion of 1:1·25 was often used, in strongly fixed moraines 1:1.

Strong mason-work had to be extensively used and in various slopes. When the condition of ground and space did not permit the laying of 1¼ ft. talus, and that good stone was plenty in vicinity, then 1 ft. dams, wholly or partly in stone, were built. These stone works are very frequent, and have been built to a hight of 20 metres without any mischance. (Fig. 1.) Even dry walls have been constructed to the hight of 10 metres, with a sloping proportion of 1:⅔, but then the stone material was very fine and the work carefully executed. The arrangement of these works is seen in

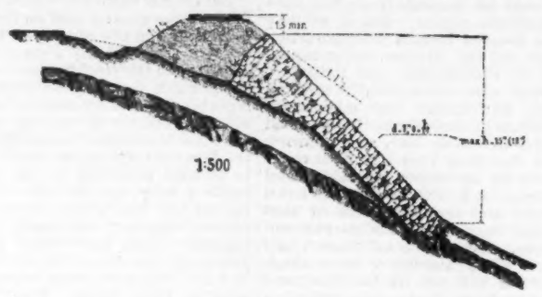


FIG. 1.

Fig. 2. As a rule the supporting walls should have had an inclination of ¼, but it was found more advantageous in many cases to make them vertical, and more such have been built on the Gothard lines than is usual.

In general all the viaducts and bridges were built of mason work, but in some cases a small viaduct was judged preferable. Fig. 3 shows the system adopted for such cuts where they had to be carried out under too great a cost. Iron had, however, to be used where the spans were long.

Coming now to the mechanical execution of the work, we find that the Belgian system of perforation was adopted from the beginning—April 4, 1873. The rubbish was removed by two systems, but at Goeschenen and at 5000 metres from the Airolo and the floor of the small gallery was placed on a level with the platform for removing the rubbish.

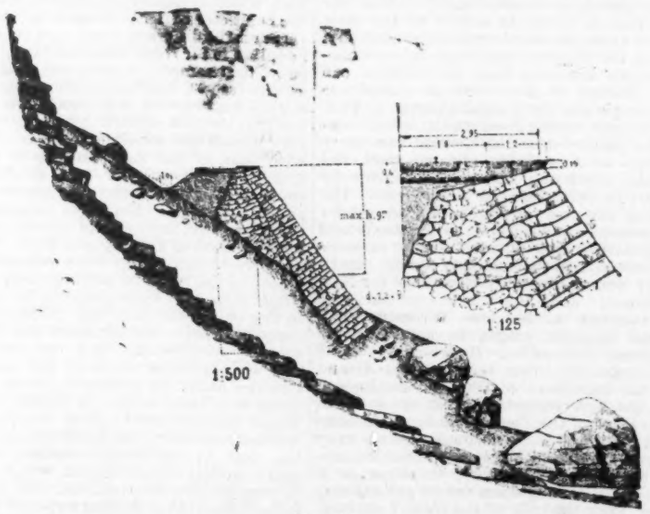


FIG. 2.

A great deal of trouble was experienced in the mechanical perforation of the headings, as the vault had to be made, owing to the nature of the ground, before sinking the heading. As soon as the heading was open the left abutment was made by supporting the vault on corner arches which allowed the transport of the upper to the lower part and to begin to attack the banks. This was always done by hand. The greatest care was given to the tracks for the wagons, of which 350 loaded were sent out every twenty-four hours.

Dynamite was used in preference to any other explosive at the beginning, but explosive gum was used latterly. Explosions from thawing the dynamite were altogether avoided by having the cartridge in zinc boxes and these latter placed in zinc-lined boxes. Warm water being put between them, the dynamite was warmed in a regular bain-marie. In the preparing shed the temperature was kept up to the required degree by steam vapor, &c. The floor was carefully strewn with fresh sawdust every day. The light was sent in from outside.

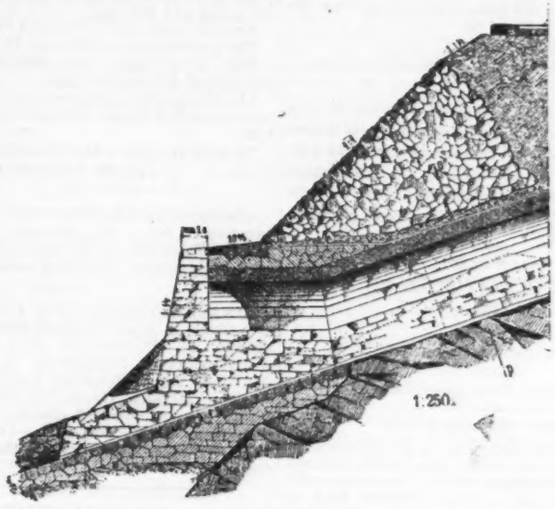
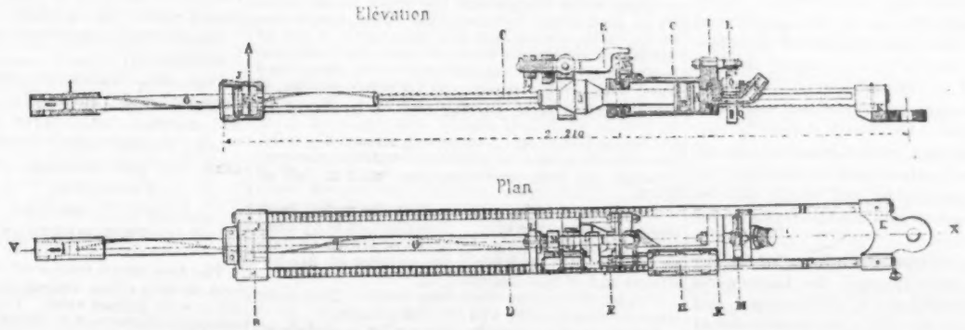


FIG. 3.

Of all the borers used that of Mac-Kean, improved by Seguin, was found most efficacious. The run is longer, and there is no escape of compressed air. The percussion motion is determined by the play of a cylindrical valve acting on piston, the valve turning on its own axis. The general system of distribution is favorable to great rapidity. The rotary movement of the punch is owing to a helicoidal groove in the tool-holder, into which catches the collar of a toothed washer placed in the head. This washer rests against another. In the forward movement of the piston the first washer is brought forward with the tool-holder, and turns on itself, while the tool strikes without rotating. In the backward movement, on the other hand, the first washer or disk gears into the other washer, thus fixing it steady and forcing the punch to rotate, and as it is the withdraw movement there is no resistance. According as the hole deepens the piston advances in the cylinder, and would strike the bottom if the latter remained immovable, but the cylinder is made free by a device, and the air is brought in front. The backward movement is produced by raising a lever with an eccentric, and thus lowering the piston; as the cylinder is not behind it retreats at every stroke of the piston, as it used to advance when fixed in front. (Fig. 4.)

FIG. 4.—SECTION THROUGH V X.



MACKEAN-SEQUIN BORER.—STROKE OF CYLINDER ON LONGITUDINAL SLEEPERS.

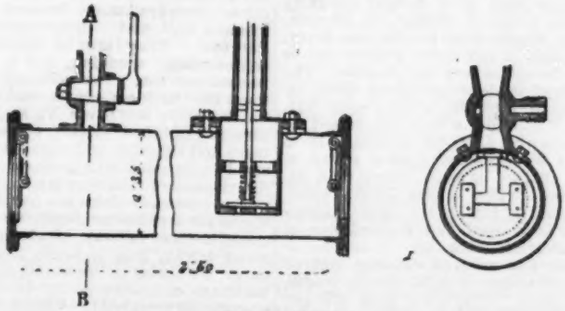


FIG. 5.—PUMP.

One of the greatest difficulties met with was the enormous quantity of water which broke into the tunnel from the Airolo side. The whole southern slope of the mountain was full of springs. The very borers were stopped, and the dynamite forced out before it could be used, so strong and universal were the springs. In July, 1875, the quantity of water coming from the tunnel was 348 litres per second. M. Favre thought he would use compressed air for working a pump. (Fig. 5.) There is a valve at each end. A cock with three conduits acts as feeder or exhaust for the compressed air, while a tube of smaller diameter, having a stop valve, allows the escape of the water. Metallic wires prevent any foreign substance from entering the pump. When put in a mass of water the valves open, the tube is filled, and when the air-cock is opened the water is expelled.

The temperature formed the most dangerous of all the obstacles, and it would seem that the very limit of human endurance was reached in the St. Gothard.

A COMMON PRIME MERIDIAN.—The Senate has passed the resolution of which the following is the text, and it seems that the serious embarrassment now felt in the affairs of commerce, through the absence of an accepted standard for the computation of time, will be relieved:

"*Be it Resolved, etc.*, That the President of the United States be authorized and requested to extend to the governments of all nations in diplomatic relations with our own an invitation to appoint delegates to meet delegates from the United States in the city of Washington, at such time as he may see fit to designate, for the purpose of fixing upon a meridian proper to be employed as a common zero of longitude and standard of time reckoning throughout the globe; and that the President be authorized to appoint delegates, not exceeding three in number, to represent the United States in such international conference."

THE River and Harbor Appropriation bill, as passed by both Houses of Congress, appropriated $18,743,875. On the first instant the President sent a message to the House of Representatives refusing to sign the bill and stating his reasons. The principal objection was "that it contains appriations for purposes not for the common defense or general welfare, and which do not promote commerce among the States. These provisions, on the contrary, are entirely for the benefit of the particular localities in which it is proposed to make the improvements." On the second instant the bill was passed over the veto, and the amount above-mentioned will be expended on the items composing the bill.

CORRECTION.—In our article "Cheap Motive Power," published last week, in the formula, $K =$ 3. should be $K = .3$; "Hirm Bros.," should be "Hirn Bros."

PERSONAL.

MR. J. E. SICKELS is Chief Engineer of the Evansville, Dayton & Eastern Railroad. The road will be constructed at an early day.

CARLOS MORENO has been appointed by the Mexican Government Inspecting Engineer of the Topolovampa road.

EDMUND HARDING has been appointed Chief Engineer of the Toledo, Cincinnati & St. Louis (N. G.) Railroad.

MR. JAMES R. DE REMEO has resigned the position of Assistant Engineer on the Denver & Rio Grande (N. G.) Railroad.

THE AMERICAN INSTITUTE OF MINING ENGINEERS.

The railroad fares to Denver and return from New York City, for the meeting of the society in August, is $113, which includes sleeping cars, both ways. Saving over ordinary fare, $26. The minimum cost of the entire trip will hardly be less than $250, which will probably prove a good investment for all who decide to go.

IN MEMORY OF ALEXANDER LYMAN HOLLEY.

NEW YORK, June 14, 1882.

DEAR SIR: After the death of Mr. Alexander Lyman Holley, the American Society of Civil Engineers, the American Institute of Mining Engineers, and the American Institute of Mechanical Engineers, in each of which he was a leading member, appointed special committees to devise and execute suitable measures in honor of his memory. These committees have united for common action as a joint committee, and this joint committee has appointed the undersigned a subcommittee, with authority to issue the present circular.

Both the character and the career of Mr. Holley marked him as a true representative of the highest type of American engineers. Without undervaluing the great advantages of foreign travel and culture, we deem it a significant circumstance that our departed colleague was educated in American schools, and bred in American practice. When he began the journeys abroad from which so many important results were to flow, it was with a thorough knowledge of the condition and needs, in his native land, of the arts with which he was connected; and the astonishingly numerous and varied lines of inquiry which he pursued had one element in common—the dominant purpose of his life—to gather for the benefit of this country the best fruits of skill and experience abroad. Our railway practice, our ordnance system, our steel manufacture, and many incidental points in our mechanical engineering, were successively illuminated by his skillful analysis and criticism, and enriched with the treasures he had wisely selected from foreign sources, as well as the fruits of his own inventive genius.

As an active and enthusiastic laborer for the elevation of the profession through the harmonious co-operation of its members in this country, and as an inspiring instructor and sympathetic friend of young American engineers, his influence was scarcely less important. The unanimity and extent of the expression of sorrow at his death might be called national, had they not been augmented by so many voices from beyond sea.

Finally, his personal virtues and attractions were such that his countrymen may well delight to honor him. No atom of envy or detraction alloys the praise which all are eager to bestow upon him. Alike in private and in public life, he was beloved as much as he was admired.

It was natural that from many quarters the suggestion should come of a memorial more permanent than words to a life so worthy in itself and so fruitful of blessing to a nation. In obedience to this suggestion, and after due consultation, the following plan has been adopted:

It is proposed to erect in the Central Park of this city a monument to Alexander Lyman Holley, consisting of a suitable pedestal in stone, with architectural and symbolic decoration, surmounted by a portrait-bust in bronze. The cost of the whole, executed by the best obtainable skill and after designs to be approved by the joint committee, will be about $10,000. Before further steps are taken, it is desirable to ascertain by actual subscriptions the amount of money which may be relied upon; and for this purpose the present circular is issued.

In order that the opportunity of taking part in this testimonial may be extended to as great a number as possible, subscriptions will be received from all who desire to contribute. No limit has been fixed, as it is desired that each subscriber give according to his ability, and that the list be large. Names and money may be sent to Charles Macdonald, Treasurer, 52 Wall street, New York City, and will be periodically acknowledged in the *Iron Age*, the *Engineering and Mining Journal*, and the *American Machinist*. The subscription is not confined to any class or profession, but is cordially opened to all who sympathize with its object.

CHAS. MACDONALD,
R. W. RAYMOND,
J. C. BAYLIS,
} Sub-Committee.

[We publish the above circular, because we feel that a great many civil engineers, who otherwise might not receive it, will feel it a privilege to contribute something to the memory of ALEXANDER LYMAN HOLLY. It is not necessary that we add anything that we could say to the above circular. —ED. ENG. NEWS.]

THE HISTORY AND STATISTICS OF AMERICAN WATER-WORKS.

BY J. JAMES R. CROES, M. AM. SOC. C. E.

(*Continued from page* 263.)

CCCLXVIII.—FREDERICK CITY.

Frederick City, Maryland, is on level ground in a basin 280 ft. above sea level, in a valley inclosed by the Catoctin Mountain on the northwest and the Linganore hills on the east. Carroll Run, a small stream, flows through the centre of the city.

Settled more than a hundred years ago, it was incorporated as a city in 1805.

Water-works were built at a date which it has not been possible to ascertain, by a private company, taking the supply from Saw-mill branch of Carroll Run, and from springs on the Mount Philip farm.

These works were abandoned some years ago, and a supply was introduced by the city from nine springs in the Catoctin Mountain and two artesian wells, from which the water is conveyed by covered drains to a receiving house, and thence by 4½ miles of 6-in. cast-iron pipe, with a fall of 136 ft., to a reservoir built on excavation and embankment, 125 ft. square and 17 ft. deep, and lined with brick. It contains 1,900,000 gallons, is a mile northwest of the city and 75 ft. above it. In 1880 an additional supply was procured from the Great Tuscarora, a mountain stream 6½ miles from the reservoir, to which the water is conveyed through an 8-in. cast-iron pipe with a fall of 273 ft.

Two lines of 10-in. pipe conduct the water from the reservoir to the city. Distribution is by cast-iron pipe of the sizes and lengths of which no data are obtainable. Neither is the number of fire hydrants and of taps known.

The population in 1880 was 8,486. The daily consumption in 1881 was 403,200 gallons.

The cost of the works cannot be ascertained. The bonded debt is $70,000 at 5 per cent. interest. No further financial statistics are given. George Ebert is the Superintendent.

CCCLXXIX.—SOMERVILLE, N. J.

Somerville, New Jersey, in lat. 40° 35′ N., long. W., is on undulating ground on the Raritan River. It was settled about 1800.

Water works were built by a private company in 1881–2, after the plans of George H. Pierson, C. E., taking the supply from the Raritan River, which flows through a red shale district and is much discolored except in very dry weather. The water used is filtered by four multifold filters of the Newark Filtering Company's type, each 5 ft. in diameter and 8 ft. high, which are stated to have a daily capacity of 1,500,000 gallons. It is then pumped by a Worthington duplex pump, of 12-in. bore and 8½-in. stroke, driven by a 44-in. Leffel turbine wheel under 14 ft. head. There is also a steam pump of the same dimensions. The water is pumped into a stand-pipe of 10 ft. diameter and 150 ft. high.

Distribution is by 6½ miles of cast-iron pipe of from 12 to 3-in. diameter, with 42 fire hydrants, 25 gates and 180 taps. The town pays $28 per year for each fire hydrant. Service pipes are of lead.

The population in 1880 was 4,620, and in 1882, 5,160. The daily consumption is 260,000 gallons. The works have cost $50,000.

A. V. D. Honeyman is the Secretary, and J. Harper Smith the Superintendent.

CCCLXXX.—SPRINGFIELD, O.

Springfield, Ohio, in lat. 39° 53′ W., long. 84° W., is on gently undulating ground on Lagonda Creek. Settled in 1804, it was incorporated as a village in 1827, and as a city in 18—

Water-works were built by the city in 1881–2 after plans of J. D. Cook, C. E., taking the supply from a filtering gallery along the bank of Buck Creek. Two wells, 100 ft. apart, are connected 20 ft. below the surface by a dry stone culvert 3 ft. in diameter.

A Cope & Maxwell steam pumping engine lifts the water 200 ft. into a stand pipe 30 ft. in diameter and 110 ft. high. This gives a head of 220 ft. at the centre of the city.

Distribution is by 30 miles of cast iron pipe of from 24 to 6-in. diameter, with 250 fire hydrants, 260 gates and 250 taps.

Service pipes are of lead and of galvanized iron.

The population in 1880 was 20,729.

The works have cost $380,000, which is the amount of the bonded debt.

The works have just gone into operation. They are controlled by the trustees elected by popular vote.

Edward Gwynn is the Superintendent.

(TO BE CONTINUED.)

CORRECTIONS.—July 29, 1882, p. 263, *Waco*, third paragraph, for "the pressure," read "fire pressure." Page 263 in seventh line, first column, read, "Expenses, including interest, $,2,300."

ACKNOWLEDGMENTS.—The receipt of statistics, as follows, is acknowledged with thanks: From George H. Pierson, C. E., statistics of the water-works of Somerville, N. J. From H. L. Schlater, superintendent, report of the water-works of Meriden, Conn., for 1881. From H. G. Holden, superintendent, report of the water-works of Lowell, Mass., for 1881. From J. D. Moler, city engineer, statistics of the water-works of Springfield, Ohio.

CORRESPONDENCE.

PRACTICAL NOTES ON HYDROGRAPHIC SURVEYING FOR ENGINEERING PURPOSES—CORRECTION.

PORTLAND, Me., July 31, 1882.

EDITOR ENGINEERING NEWS:

I inclose a few *corrections*. July 29, 1882, page 257, near head of first column, for "beach marks" read "bench marks."

Middle of second column, for "diligently" read "deliberately."

Page 258, bottom of first column, for "announced" read "amended." Near bottom of second column, for "carry the telemetric" read "carry the telemeter." Near middle of third column, for "pair of ranges," read "set of ranges."

Yours truly, A. C. BOTH, C. E.

TWO WESTERN TOWNS.

The two smart towns of Fargo and Morehead look at each other across the muddy Red River ditch with jealous eyes. They will not bridge the stream, because each is afraid the other would profit by a convenient crossing. Vehicles ferry over on a rude flat-boat, worked by hand-power applied to a rope stretched from bank to bank, and pedestrians are beholden to the railroad company for the use of its bridge. Morehead, the Minnesota town, has three thousand inhabitants; Fargo, the Dakota town, boasts of six thousand, and styles itself the Red River metropolis. Both welter in a sea of black mud in the season of the thaws and rains; both are largely devoted to speculation in lots and land, and both are equally unattractive to the eye. They are in reality a single town, commercially speaking, and a remarkably prosperous one, too. The railroad system has made them the business center and distributing-point for the entire Red River Valley, and out of their present jumble of muddy streets, cheap-pine cottages and shanties, and vacant lots, saloons, stores, and lumber-piles, will grow up a handsome city of fifty thousand inhabitants within the present generation. Already there is a handsome hotel, rejoicing in the architectural oddities of the Queen Anne craze, a street railway, an electric light company, water-works, half a dozen banks, a daily newspaper, a number of creditable churches and school buildings, and a few pretty dwellings. Real estate speculation runs wild. Visions of a second change have turned the heads of the inhabitants. The talk is all about lots and values—how much this or that corner is worth, what Jones paid for his strip of mud, or what Smith holds his at. The real estate agents have their offices in the hotels, in order to watch the arrival of guests and seize upon the supposed capitalists seeking investments, or the immigrant looking for a farm. No well dressed stranger need wait long for the offer of a free ride about the future city and a valuable guide to explain the many choice openings waiting for him and his money.—"*The New Northwest, by E. V. Smalley, in the Midsummer Holiday Century.*

GENERAL INTELLIGENCE.

☞ *We solicit and are always pleased to publish in these columns any items of interest that may be furnished us.*

GAS AND WATER.

BROOKLYN (N. Y.) SUPPLY OF WATER.— Arangements have been made to put in operation the reserve pumping engine at Springfield Brook. It has a capacity of 2,000,000 gallons.

ILLINOIS ARTESIAN WELLS.—The artesian well now being sunk at the new city hall in Ottawa has reached a depth of 275 feet. They are now in sand-rock and have a good flow of water, and are averaging about 10 ft. per day. They have about 25 ft. further to bore before clearing the sandstone.

NEW ENGINE.—The new engine for the Phœnixville (Pa.) water-works will be ready in November. It will have capacity to throw 1,500,000 gallons a day.

WATER WORKS WANTED.—A despatch from Wabash, Ind., says:

The water-works question is again being agitated in this city. The project of obtaining a supply of water from the big well north of the city has been abandoned, as the flow was entirely too small. The City Council is now considering a scheme for pumping water from the Wabash River, and it is very likely that an election to determine whether the people want water works will be held within the next thirty days.

YORKVILLE (CANADA) WATER SUPPLY.—The question of getting a sufficient supply of water is now being agitated in the above village. The present water-works were built four or five years ago, and the water is drawn from a reservoir situate northwest of Mr. McMaster's property, fed principally by springs, but the supply thus obtained is quite insufficient for summer consumption. Last year this want was first noticed, and again this year. There are two plans now under consideration; the first is to obtain an additional supply of water from Parkdale village, for which proper preparations were made when the reservoir at Parkdale was constructed, as there is an opening where a second pipe can be attached, and room for a second set of engines. The contractor to whom the matter has been submitted offers to lay a 10-inch pipe from Parkdale to Yorkville for $40,000, and it is estimated that the cost of the extra engines would not exceed $50,000. A proposal has also been made by a syndicate of wealthy capitalists to take up the whole of the Yorkville Water-works, paying for their cost, and guaranteeing the village an ample supply of water. They have it in view to run pipes to Bond's Lake, eighteen miles distant, and if it does not yield a sufficient supply—there are no means of knowing at present—then a pipe would be run to Lake Simcoe at a cost of $250,000. Concerning the question of drainage, it is contended, in opposition to the majority of the Council, that a drain through the University Creek would cost as much as to drain down the ravine into the Rosedale Creeks, whilst it would only be an outlet for a few acres at the west end of the village; so that drainage by the ravine would be preferable, as it would drain the whole village. It is thought that a main drain from the extreme west of the village, laid due east would carry off all drainage, both north and south, independently of Toronto. Mr. A. Harvey, of Rosedale Road, has been appointed by the Yorkville Council to confer with the Parkdale Corporation respecting the supply of water.

ELECTRICITY.

THE TELEPHONE IN TORONTO.—The new telephone system connecting the different stations and call-boxes in various parts of the city with the central depot is working admirably. When the Central Station is signaled a little red indicator drops, showing the depot desiring connection, the principle being the same as used by hotel indicators.

NEW ELECTRIC COMPANIES.—The following companies have filed articles of incorporation at Albany, N. Y.: The Oswego Electric Light & Power Company; capital, $50,000. The Parker Electric Manufacturing Company, of Little Falls; capital, $40,000. The Union View Company, of Rochester; capital, $50,000. The Merchants' District Telegraph & Burglar Alarm Company, of New York.

PARIS ELECTRICAL AWARDS.—LONDON, Aug. 2.—Among the awards to exhibitors at the International Electrical Exhibition at the Crystal Palace were the following: A diploma of honor to the Anglo-American Cable Company; a gold medal to Prof. T. A. Edison for lighting apparatus, etc.; a gold medal to the Anglo-American Brush Light Company for the Brush dynamo machine and arc lamp; a gold medal to the White House Mills, of Hoosac, N. Y., for a dynamo machine; a gold medal to the Direct United States Cable Company; a gold medal to Prof. A. E. Dolbear, of Boston, for an electrostatic telephone, and a silver medal to the Philadelphia Dynamic Company. Numerous awards to British exhibitors were made.

CABLE EXTENSION IN AMERICA.—The Central and South American Cable Company, with wires touching at points on the Mexican and Central American coast, crossing the Isthmus of Panama and extending along the western coast of South America to Callao, announce that their lines will be completed and thrown open to public use by the close of the present month. Connection will be made at Galveston with the Western Union Telegraph Company, and at Callao with the Transcontinental and Eastern telegraph systems of South America, so that the two continents of the Western Hemisphere will be in complete communication.

The business of the Western Union Telegraph Company is showing a large increase. The number of messages handled at the main office average 70,000 per day.

RIVERS AND HARBORS.

THE POTOMAC.—The Washington *Republican* says: The appropriation for the past fiscal year for the dredging of the river channel near the city having become exhausted, the dredging machines and scows heretofore at work in front of the wharves have been removed to West Washington by order of the engineer in charge, Major Rainehardt, and commenced operations near Easby's wharf upon the Georgetown channel. The dredgings are carried down upon the mud scows to the flats below Analostan Island instead of being dumped upon the flats below Long Bridge as was done in former years. It is thought that by the time when the appropriation, still available for the present work, is entirely exhausted the new appropriation will permit the resumption of the work in the Washington channel.

THE KANKAKEE RIVER.—Professor Campbell, who has charge of the Kankakee valley, under direction of Governor Porter, is now engaged in that survey for the purpose of digging a new channel for the Kankakee river, by which it is proposed to reclaim from 800,000 to 1,000,000 acres of overflowed lands.

STREETS, DRAINAGE, ETC.

PROPOSALS FOR SEWER WORK.—The City Council of Grand Forks, Dakota, will receive proposals until Aug. 8 for the construction of a sewer on De Mers avenue, from Sixth street to the Red River of the North, a distance of about 1,700 ft., and 18-in. pipe with manholes and catch-basins. Separate bids may be made for the pipe or excavation. Plans and specifications may be seen at the office of the city engineer, and specifications will be sent on application.

STREET IMPROVEMENTS IN WASHINGTON.—Under the recent appropriation act for the District of Columbia, the District Commissioners have prepared proposals for the improvement of several streets in this city, the approximate estimates of which are as follows: Asphalt pavements—New Jersey avenune, from D street north to M street north; Massachusetts avenue, from 1st street north to 3d street west; Rhode Island avenue, from 9th west to 13th west; New Hampshire avenue, from M street north to Dupont circle; Pennsylvania avenue, from Washington circle to 26th street west; 14th street west, from M street north to Boundary; 2d street east, from Pennsylvania avenue to D street south; D street south, from 2d street east to 3d street east; 5th street east, from East Capitol street to Pennsylvania avenue; M street north, from New Hampshire avenue to 26th street west; 33d street west, from N street north to P street north. These streets are to be repaved asphalt, aggregating 81,926 square yards, and the with gutters and railroad track with granite blocks, the gutters aggregating 7,204, and the railroad tracks 1,504 square yards of granite block pavement respectively, the granite blocks will be furnished by the District for all streets west of 7th street, from the property yard at G street northwest, and at the 6th street property yard for all streets east of 7th street west. Asphalt block pavements are to be laid on 15th street west, from Pennsylvania avenue to B street north; 4th street east, from Pennsylvania avenue to East Capitol street; 39th street west, from N street north to P street north, aggregating 14,140 square yards. Granite block pavement is to be laid on F street south, from Half street to 4½ street west. This work embraces the grading, including haul, of 5,450 cubic yards of earth, taking up, rejointing and relaying of 3,220 lineal ft. of 5-in. blue stone, laying of 970 lineal ft. of new 5-in. blue stone curb, taking up and relaying 3,120 lineal ft. of 12-in. gutter flag, taking up and relaying 2,000 lineal ft. 16-in. gutter flag, laying 3,900 square yards new brick sidewalk, takiug up and relaying 680 square yards brick sidewalk, building four receiving basins, laying 200 ft. 12 in. sewer pipe, laying 6,280 square yrds granite block pavement, and the taking up and relaying 300 square yards of granite block pavement. The granite blocks, new curb and sewer-pipe will be furnished by the District. North Capitol street, from E to K streets, is to be graded and regulated, embracing 8,500 cubic yards of grading; hauling same; graveling 8,450 square yards; laying 553 lineal ft. 5 by 20-in. blue stone curb; taking up and relaying 2,782 lineal ft. of 5-in. blue stone curb; taking up and relaying 1,730 square yards cobble gutters; laying 3,100 square yards brick sidewalks; taking up and relaying 1,150 square yards brick sidewalks; laying 1,007 lineal ft. 12 in. gutter flag; taking up and relaying 2,597 lineal ft. 12-in. gutter flags; taking up and relaying 1,657 lineal ft, 16-in. crossing flag; setting 36 lineal ft. 6-in. granite circular curb; building four receiving basins; rebuilding three do., and laying 200 lineal ft. of 12-in. sewer-pipe. The District furnishes the curb, sewer-pipe, bricks and all other material necessary for the work.

RAILROADS.

STREET RAILROAD INCORPORATED.—The Minneapolis & St. Paul Street Railway Company, $1,000,000 capital, has filed articles of incorporation with the Secretary of State. The object of the corporation is to run a motor line between the two cities to connect with Lake Como, and to operate a telegraph and telephone system.

RAILROAD STATISTICS.—Who gets the most out of the railways, the bloated capitalists who have the impudence to build them, or the downtrodden people who ride on them and ship by them at astonishingly cheap rates and the vast army of men, women and children whom they support? Let us see. In round numbers in 1881—

The railways earned $725,300,000.

They paid out for working expenses $440,600,000.

The interest on their bonds was $128,600,000.

They paid their stockholders in dividends $93,300,000.

What farmer, out of every $100 which he receives for his crops, pays his laborers $62, the holders of his mortgage $17, puts into other necessary outlays $9, and keeps only $12 for his capital, labor and risk? Not one. —*Railway Age.*

A NARROW-GAUGE ROAD SOLD.—ST. LOUIS, July 27. —The West End narrow-gauge road, 17 miles long, was bought to-day by James E. Young, of Chicago, for $87,000. The road will be bonded for $200,000 and extended to Creve Cœur Lake, the St. Louis regatta water, and to St. Charles, on the Meramec River.

MEXICAN ROADS.—A despatch from Matamoras to the St. Louis *Globe-Democrat* gives the following account of the progress being made on the railroads in Mexico: The various railroad enterprises over the Republic are generally progressing favorably. The Central Railroad has reached Celaya on its Southern Division, and on the northern end they are but about thirty miles from Chihuahua. Their side competitor, the San Louis Potosi and Tampico Railroad, at present languishes. They have some twenty-six or twenty-eight miles of road completed to a little place called Buena Vista, and now have a bad stretch of over twenty-five miles, without water, to cross before reaching the mountainous country. Work has about stopped, there being a great lack of laborers, the men leaving on account of the mismanagement of the former superintendent, who, with an abundance of money and material, and over 3,000 workmen, built less than thirty miles of road. The National Railroad, or Palmer & Sullivan folks, are going ahead at all points on their line, and will shortly be running into Monteray. It is the general opinion that they will stop there some little time, as the road beyond, to Saltillo, is over a difficult and rocky country.

FAST APPROACHING COMPLETION.—NORWALK, Ohio, August 1.—Iron on the Wheeling & Lake Erie is now down into Toledo, and the ballasting nearly finished. The link connecting it at Massillon with its new acquisition the Cleveland & Marietta at Zoar is also completed, and the whole line from Marietta to Massillon, and thence to Huron and Toledo, is open for trains. The announced opening for regular traffic, to occur this week, on account of the scarcity of labor during harvest to complete the ballasting, has been postponed for two weeks. Work on the shops here is progressing with speed. The large brick repair-shop is being roofed today, and brick-word on the ronnd-house begun. The foundations of the other structures are practically done. They propose by October to employ one hundred men in these shops.

THE LITTLE FALLS & DAKOTA ROAD.—The amount of track laid in June was six miles, and in July nineteen; total of twenty-five miles. The grading is all completed for 35 miles from present terminus of track and the company expect to get the tract on that the coming month, which will bring it to Glenwood, Pope County, Minn.

ROAD SOLD.—The Indianapolis & St. Louis road has been sold to the Cleveland, Cincinnati & Indianapolis Company for $1,396,000.

INCORPORATED.—Articles of incorporation have been filed at Albany, N. Y., by the Hornellsville & Conhocton Valley Railroad Company, of Hornellsville. Capital, $160,000.

THE Catskill Mountain Railroad, running between Catskill village and the mountains, has been finished.

CANADIAN NOTES.—Grading the line of the Lake St. John Railway hrth of Raymond is now proceeding rapidly, 300 men being employed upon it. It is hoped 10 miles more of the line will be opened in November next A new iron bridge of 250 ft. span, to cost $40,000, has been ordered for crossing the Anne River at St. Raymond. The new stone piers at the extremities of the bridge over the Jacques Cartier River at Conolly's mills are being rapidly completed.

CANADIAN NOTES.—The Portage, Westbourse & Northwestern Railway has been constructed to Westbourne.

BARBED wire fence is being rapidly substituted for the old board fence on the Grand Trunk line between Toronto and Brockville.

THERE is likely to be considerable contention between London and Brantford as to which city will secure the workshops which will be necessitated by the fusion of the Grand Trunk and Great Western Railways. Mr. Wallis, Mechanical Superintendent of the Grand Trunk, was prospecting west of London this week with a view, it is understood, of making the location.

ACCORDING to the Lindsay *Post*, it seems that the Midland and Ontario & Quebec railways, from Perth west to Peterboro', are located as closely as possible to each other for some fifty miles of the distance, the centre lines being only 65 ft. apart. About 500 men are now employed on each line, and the work on both is being pushed as speedily as possible.

A NEW style of excursion car is being introduced by the Midland. They are comfortable, roomy cars, covered and well-seated. An additional convenience is that the passengers can get off and on by the entrance at the sides of the cars, no small consideration when the hasty way in which excursionists clamber on to trains is considered. The cars will enable the road to meet the heavy demand for train service in excursions to Toronto and other points.

STEEL RAILS are to be laid on the Grand Junction between Belleville and Stirling.

THE work of surveying and laying the whole line of the Central Railway will be completed within two weeks.

A GANG of 150 men, divided into three clearing and six grading gangs, have been set to work on the Ontario & Quebec, at Indian River in Cavan township. Messrs. McDermid & Hendrie, the contractors, intend commencing work near Peterboro' very shortly.

MR. WOOD, the contractor who built the Credit Valley, has been engaged along that road in collecting opinions as to the benefits derived from it, which he intends to bring to bear on those interested in a projected road in the St. Catharine's district.

TUNNELS.

A CHICAGO TUNNEL.—The walls of the La Salle street tunnel, from the main opening to Randolph street, have shown a decided inclination to "bulge in," and the thoroughfare is closed for a season in consequence. There is a fear that it may be necessary to rebuild some sections from the foundation.

CONTRACTS LET.

HOTEL CONTRACTS LET.—The contract for building the new hotel to be put up at Emmetsburg, Ia., by the Scottish-American Land Company, has been let for $19,000.

A NEW MEXICAN CONTRACT LET.—The contract for grading 46 miles of the Silver City, Deming & Pacific Railroad has been let to John Scott. Time limited to 90 days. This is a new company, organized in March to build standard gauge road from Silver City, the center of the great New Mexican mining district, to Deming, the junction of the Atchison, Topeka & Santa Fe and Southern Pacific Railroad. Grading will begin Aug. 1. J. P. Whiting, of Boston, is the president of the company; Major E. G. Shields the chief engineer.

The contract for iron, furring and lathing at the Philadelphia Court-House and Post-Office has been awarded to J. W. Hoyt at $33,700. One of the bids for this work amounted to $121,000.

BUILDING.

A NEW FREIGHT DEPOT.—A Chicago dispatch says: "The officials of the St. Paul Company have decided to tear down the old repair-shops and adjoining buildings south of Fowler and east of Sixth street bridge, and to erect in their stead a large freight depot. The machinery now in use in the shops will be sent to the new Menomonee Valley works and utilized there. The cost of the new freight-house will be $75,000, and work upon it will begin before the end of the summer. The present freight accommodations of the company are entirely inadequate, and this new move of the management is one that is deemed absolutely necessary, owing to the enormously increased freight traffic.

SWARTHMORE COLLEGE.—The total subscriptions for the rebuilding of the college amount to $77,895.

LABOR.

WAGES IN THIS CITY.—Mayor Grace has been informed by the Dock Commissioners that they have decided to increase the wages of the laborers in their department from 20 to 23 cents per hour, and the wages of the dock-builders from 25 to 28 cents per hour. At the request of the workmen they will be employed ten hours per day.

WAGES IN INDIANA.—A note from Montpelier says: The Fort Wayne, Cincinnati & Louisville Railroad Company have at last secured men to lay their new steel rails on the north end, paying them $1.50 per day. Since harvest commenced the section men have been helping to take up the harvest along this line at good wages, leaving the company destitute of section men. However, the increased price per day offered now by the company assures plenty of men, and work has already commenced under the supervision of Roadmaster Wagner.

BRIDGES.

THE BROOKLYN BRIDGE.—On the 2d inst., Mr. Henry C. Murphy, President of the East River Bridge Trustees, sent to the Mayors of both cities the following report of the work done on the bridge during the past week: "The work done on the bridge during the past week has consisted of regulating and bringing to grade the floor beams and bottom chords from Panel No. 14 to Panel No. 20, preparatory to the erection of the trusses to that point, and the erection of a portion of the posts. The six floor beams at the slip-joints in the trusses have been received, and four of them have been put in place. A large amount of work has been done in putting in place scattered members here and there, as they have arrived, consisting of bridging trusses, lower chords, intermediate floor beams, etc., which have been omitted in consequence of not having been delivered regularly and in order. The men in the yards have received, assorted and stored the steel as it has arrived, and sent it aloft, as required, and when not so employed have continued the painting. The paving has been commenced on the Brooklyn approach. On the Franklin square (New York) bridge, the plates for carrying roadway have been riveted. The cast-iron fenders for one roadway have been erected and secured. Four trusses are now completed and the erection of the bridge is about half completed. There has been received during the week from Edge Moor 191 1208-2000 tons of steel, making the receipts of that material during the month ending July 31, 470 1668-2000 tons. The first contract of the Edge Moor Iron Company for steel, amounting to 5,500 tons, has been finished, and 138 298-2000 tons have been received on account of the second contract, which amounts to 1,064 tons, leaving 926 tons in all yet to delivered."

A CORRECTION.—In our last issue we published the following item:

The Central Bridge Co., of Buffalo, N. Y., has the contract for the bridge over the Delaware River at Portland, Pa., for the Pennsylvania, Slatington & New England railroad.

The contract was awarded to C. E. Danforth, 71 Broadway, New York.

A CHICAGO VIADUCT.—Some interesting details concerning the Chicago viaduct over the Chicago, Burlington and Quincy railroad, at Polk street, which has just been completed, have been published. The work was done at the cost of the railway company, but under the supervision of the engineers of the city, who were instructed to see that proper provision was made for the public. The result is a bridge which is pronounced one of the finest in Chicago. It is constructed of iron, in two spans, each measuring 172 feet long. The total length, with the approaches, is 2,074 feet. The width is thirty-eight feet in all, and of that space twenty-two feet is given to roadway and five and a half feet to sidewalk on each side. In the construction of the approaches a rise of one foot in forty is given on Polk street, and one in thirty in the approach on Canal street. The iron work was supplied from a foundry at Buffalo. If a viaduct should be valued by its cost, this one should be held in high estimation, for the railway company has been called upon for $111,115, without taking into consideration the sums it had to pay the owners of land damaged in the execution of the work.

REPORT OF THE ADVISORY COMMISSION UPON DIFFERENTIAL RATES.

Continued from page 269.

transportation service the cost of the service, as above explained, they would benefit their average condition very greatly by accepting it, for they are not now receiving, on an average, anything near the average legal interest of the country on the cost of their investments.* Many of the companies—perhaps the majority of them—in order to realize cost, would be compelled to increase their charges very considerably, while others, including perhaps some of these trunk lines, might be called upon for a reduction. The general result would be, not a diminution of charges, but an increase; and it is hardly probable that the country at large would be satisfied with the change, though it might affect particular localities favorably. Moreover, we are to consider that the question of the application of the cost standard to railroad charges arises for discussion and settlement after cities have been built, routes established, canals made and railroads constructed; and that the solution of the question may affect all these beneficially or otherwise to an extent that is beyond present calculation. We have not an unsettled country before us to plan and make laws for, whose people, when they select their homes and places of business, can calculate the result of existing rules and regulations upon the towns they build, or the industries they establish; but the towns already exist, and have been created at immense cost, in view of advantages which were supposed to make them attractive and desirably as location for trade and commerce; and their existing importance as the homes of great numbers of people, and as the centres of vast manufactures and immense exchanges gives them claims upon the country and upon those who have in any degree the material interest of the country in charge, and gives them powers of defence also when assailed in the rivalry of business, which are not to be overlooked or lightly regarded.

The several towns, it is true, came into existence under circumstances which may be different from those which now surround them; and in view of advantages, which in many cases have been rendered comparatively unimportant by subsequent improvements and inventions—as canal and river navigation in many parts of the country has been rendered unimportant by the invention of the locomotive and the iron road—but the towns themselves, their people and their business remain as great and sturdy facts, which neither the country can overlook, nor the government of the country, nor any of its public agencies. The continued existence of these towns is to be assumed, and their welfare is to be calculated for when laws are made, or regulations having the effect of laws are established. It would be as inadmissible and as unjust deliberately to plan and arrange for the gradual destruction of a great city through the slow but certain annihilation of its business, as it would be to bring destruction upon it by fire or pestilence; and we are not to contemplate with complacency an offence of that nature against organized society. While it is not the province of government to build up cities for its people, it is its plain duty to permit the cities the people build to live; and it should so shape its own action as to allow every town, as far as possible and reasonable, to avail itself of all its natural and acquired advantages in addition to the prosperity, happiness and comfort of the local community. This seems too plain and indisputable a proposition to be contested by any official authority or public agency.

In a certain sense railroad companies are public agencies, and in some degree they exercise powers which are *quasi* governmental. They make regulations for their business to which the general public are expected to conform; and these regulations are, in some respects, as important as the police laws established by the state itself. Among these are the regulations respecting charges for railroad service. According as these are heavy or light upon the traffic of a particular locality, its trade is likely to decline or prosper, and so dependent is commerce upon railroads that the growth of a town is likely to bear some proportion to the extent of its railroad facilities, and the liberality with which it is treated by railroad managers.

We should consider then what might be the effect of a strict application of the cost principle as between the competing Atlantic cities, say, for illustration, the cities of Baltimore and New York. Baltimore is now a large and prosperous city; it is the chief business center of a territory larger than any one of the states, and millions of people find their business favored and their prosperity and comforts enhanced by its existence. One of the most costly roads of the country, with extensive connections and feeders, has been created with almost exclusive regard to Baltimore business; and the road will prosper if the city prospers, and lose its importance if the city decays. A great number of private individuals and public and private corporations are interested in the stock and indebtedness of this railroad company, and would be subjected to embarrassment or suffering if it were forced into bankruptcy. For all these reasons the welfare of Baltimore is a matter of national importance, and it is so connected with the trade of the interior that its existence modifies beneficially all the markets. But its relations to the foreign trade are also such as to render it important to the whole civilized world.

But New York has some most decided advantages over Baltimore, of which its people have availed themselves with great ability and energy. The growth of that city has not been checked by the marvelous prosperity of other towns, and its relative superiority in both foreign and domestic commerce has been substantially maintained. Though Baltimore is much nearer the grain fields of the West, New York still draws to itself much the larger share of the harvests, and it has done this in spite of the fact that, with temporary and unimportant exceptions, the differential rates have at all times been largely against that city. Suppose now that under an application of the cost principle the differentials could be abrogated, what would be the effect upon Baltimore? Would it deprive that city of the share in the trade of the country which its location, its great expenditures and the skill and enterprise of its people have hitherto secured for it? Would it check the growth of the city, sap its prosperity, and bring ruin upon those everywhere whose business arrangements and investments have been made with a view exclusively or mainly to the trade of that city? And if so, would the result be one that the country could contemplate with satisfaction as the just result of the proper application of a sound principle, and that those having influence in railroad affairs could justly and properly plan for, labor for and shape their tariffs to accomplish?

On the other hand, suppose the strict application of the cost principle should be found to require that the differentials against New York should be doubled, would it be admissable to double them irrespective of all consequences to the trade and prosperity of that city? That these consequences might prove disastrous if the principle could be upheld and enforced seems certain, for it would give advantages to the town most favorably located for cheap commercial intercourse for which the others could have no compensation. But this very fact—if there were no other impediment—would render the application of the principle impossible. A great city possesses great powers of self protection, and it must exercise them to the fullest extent when the need comes. Great railroad corporations cannot, in their rivalry with each other, accept principles of action which must necessarily impoverish them. If the Baltimore & Ohio Railroad would lose its business under the application of the cost principle as between it and the roads north of it, it must accept less returns upon its business, and it must continue the struggle even though no more than operating expenses be realized, rather than submit to destruction without an effort at self-preservation. This or something like it must be the inevitable result, for neither cities nor transportation companies can or will accept a principle which it can be seen in advance must build up some on the ruin of the others.

But when it comes to applying the cost principle to the several lines which serve the same city, it is at once perceived that the difficulties are insurmountable. The application must of course be made on estimates of probable results, and the estimates will have in view a percentage of profits which it is expected or hoped will be realized. But with four or more lines of very different length competing for the same business, it is evident that cost must have, when applied to their business, very different meanings. If the shortest and cheapest line makes its charges on a calculation of say 10 per cent. profit, the longest and most expensive must conform to the charges, even though they be such as will insure no profit at all. One company may then carry at a cost which includes 10 per cent. profit, another at a cost which includes say 20 per cent. profit, while the third barely pays its operating expenses and repairs, but still obtains the cost of moving the freight. Competition obliges the companies to take what they can get, and to satisfy the demands upon them from it; but when the cost standard is so uncertain and elastic that it may include profits when they can be earned, and must exclude them when they can not be, it is evident that it cannot be astandard of general or just application. It is impossible that anything can be a governing principle, which, in

* In Poor's Manual the aggregate cost of the railroads of this country and their equipment to 1881 is given at $4,653,609,297. The railroad companies paid in 1880, in dividends, $77,115,410; and for interest on bonded debt, $107,806,328. To 1882 the cost was $5,577,996,931. There was paid in 1881, in dividends, $93,344,200, and for interest $128,587,302. It will be seen that the dividends and interest together are about four per cent. on the cost of the roads and equipment; the dividends being much the smaller part. No doubt there is much "watered" stock, and a large allowance may be made therefor, without affecting the accuracy of the statement in the text.

the nature of things, cannot have the same meaning to the several parties who are to be affected by its application.

That the cost to the roads themselves of moving their freights, irrespective of profits to shareholders, has much to do in determining the charges is, we think, unquestionable. It certainly must have influence so long as competition between lines exists, for the most economical line may fix rates on a consideration of what its favorable circumstances will enable it to endure, and all others must accept them whether they prove satisfactory or otherwise. One cheap line may thus give to a town the benefits of cheap transportation, not as an application of the cost principle, but because its favorable circumstances enable it to do so consistent with its own interests.

The idea was not put forward in any of the arguments that the application of the cost principle could be made universal, and that every railroad company should apply it in its own business as between the different kinds and classes of freight. The difficulty in doing this as a mere matter of accounting would be very serious, but there would be other difficulties which would be more important to the general public. The chief of these would be this: That very many articles would not bear transportation for the very considerable distances for which they are now carried if the charges upon them were graded strictly by the cost. If their bulk or weight is large in proportion to their value they must be carried cheaply or they cannot be carried at all; and freights are therefore classified in the tariffs so that the lighter but more valuable articles are made to bear a burden out of proportion to the cost of carriage in order that the roads which carry them may be enabled at the same time to serve the public in the exchange of articles and products whose value will not admit of like charges. Some discriminations of this sort are essential to enable railroads to answer the expectations and meet the needs of the public. It must often happen also that where two or more roads are competing for a particular business one of them must carry what it gets of it without profit and must find its profit elsewhere. If the competition under such circumstances leads to the road carrying one kind of traffic at a loss, which is made up by an increase of burdens on the remainder, a wrong is done of which complaint may justly be made. But there is no inherent wrong to any one in a road conveying without profit, but also without loss, a business which it must accept on those terms or decline altogether.

THE PRINCIPLE OF COMPETITION.

If neither distance nor cost gives us the governing principle, we must next see whether we are to find it in competition. In nearly every other kind of business the competition of those engaged in it is the great regulator of charges, and the operation of natural and familiar laws of trade prevents extortion and brings about substantial uniformity. Will competition do this in the business of transporting property by rail? If so, is not the competitive principle the true principle? And will not the competitive principle make cost and distance elements in the determination of rates and allow to each its just value according to the circumstances?

We should be glad to feel able to give to these questions an unhesitating answer in the affirmative. We have found, however, in the course of our investigations, that a species of competition has prevailed from time to time, which has brought satisfaction to few persons, if any, and which has resulted in inequalities and disorders greatly detrimental to trade. Such competition exists when the railroad companies, or those who are permitted to solicit business and to make contracts on their behalf, set out with the determination to withdraw freights from their rivals, and secure them for themselves, at all hazards, and regardless of gain or loss; and when, acting upon this determination, they throw to the winds all settled rates, and in the desperate strife for business offer any inducement in their power which will secure it. The country not long since had experience of such a season, and everywhere we listened to complaints of the injury which legitimate business suffered from it. It was said by parties interested in transportation that the inauguration of such a strife put an end for the time to all possibility of calculating from day to day what would be the cost of carriage, and what could be safely paid or wisely accepted for grain, provisions, or other articles, destined to another market by rail. The control of railroad rates, and, to a large extent, of all railroad business, then passed out of the hands of the legitimate and regular corporate managers into the hands of solicitors for fast freight lines and other agents, who made from day to day, and from hour to hour, such terms with those having business as would secure it, but generally made secret terms—that the bargain with one man might not prevent their driving a better bargain with another, as they might find opportunity. Under such circumstances persons were favored and localities were favored, when the object to be immediately accomplished seemed to require it, regardless of the just maxims of legitimate business, and of the rules of the common law, which enjoin upon common carriers that they shall deal with all customers upon principles of equity and relative fairness. Legitimate business, it was said, necessarily passes into an unsettled and speculative state while this condition of things exists; safe and close calculations are impossible; transportation becomes cheap, but neither producer nor consumer is certain to reap the profit, for the middleman cannot calculate upon steadiness in low rates, and as he takes the risk of their being raised upon him, so he is in the best position to appropriate the benefit while they continue. Meantime, railroad profits disappear, and dividends cease to be paid, to the great distress of thousands who rely upon them for their living; and every interest, in any degree dependent on railroad prosperity, must participate in the depression and disaster which accompanies the ownership of railroad shares.

The mere statement of these results is sufficient to show that this is not what in other business is known and designated as competition. Competition is the life of trade, but this is its destruction; competition brings health and vigor, and secures equality and fairness, but this paralyzes strength, and makes contracts a matter of secrecy and double dealing. In competition, the sound dealer, operating upon his own capital and upon well-established credit, has the best chance of success; but in the sort of competition we have mentioned, it is found that the bankrupt corporation has the advantage, for its managers, having nothing to lose, may offer rates which solvent roads cannot meet without being dragged into bankruptcy with them. Railroad managers do not concede that this state of things is properly designated competition, but they speak of it as an unnatural condition of railroad hostility; as unreasoning railroad warfare; as competitive strife, rather than competition. It is a state of things that, like a war between nations, from its very destructiveness, cannot be a normal condition, but must speedily terminate in peace or in disaster. It has usually been terminated by a common understanding between railroad managers upon a tariff of rates.

But this common understanding, it is urged in some quarters, eliminates competition from the sphere of railroad business, and we escape the evils of competitive strife by embracing those of monopoly. This is denied by railroad managers, who insist that understandings respecting the reasonable management of their business are not only entirely consistent with competition, but that they are the only means whereby the excessive competition at some points can be prevented from operating oppressively at others. It is, no doubt, true that competition tends to produce some great inequalities, and that care ought to be taken to prevent this. It should never be forgotten that the transportation of property and persons by railroad is not exclusively a private business, but is carried on under franchises granted by the State, which confer upon the owners functions of a semi-public nature, and charge them with semi-public duties. The railroad manager, operating under such a franchise, must harmonize the interest of his road with the public duty, and he cannot make self-interest the exclusive guide, as a merchant may, or a farmer. One of the chief of these public duties is to make only reasonable charges, and to regulate and apportion these among the customers of the road on principles of equity and relative equality. But the operation of competition is perpetually in conflict with this duty; it is felt unequally along railroad lines; it will be active at points where several lines can compete; it will be moderate at others where there is little to excite it, while at still others there can be no competition, because there is but a single road. But the capital of a railroad company is planted on a certain line; it must be made available to its owners there or nowhere; it cannot be removed when found unprofitable, as a merchant may remove his stock of goods; and the tendency of excessive competition is to cast upon the business of non-competing points a cost for transportation which puts them to great relative disadvantage, and in extreme cases may prove ruinous. The local traffic is likely to experience this result most severely, and the more completely any particular line occupies a territory, the more is the local traffic exposed to peril. The New York Central Railroad, with no connections west of Buffalo, would be a mere local road, and must find remunerative returns upon all its immense investments from the local business; as a great through line, it is enabled to cast upon through traffic a part of the burden which local traffic must otherwise bear; but if under the stress of unreasonable and excessive strife for through freights that class of freights is carried at a loss, this loss must either fall upon the corporate shareholders, or it must be cast by the corporation upon the shippers of local freights. It must be assumed that railroad boards will always seek to so arrange their tariffs of rates as to secure a satisfactory net profit; and if a part of the business pays too little, the remainder may be made to pay too much. This is not a beneficial result of competition, or one consistent with the obligations of the railroad companies to the public. No one disputes or doubts that for the general public the business of transportation by rail is in the most desirable state when it is so conducted that the charges for moving property are distributed with relative equality over all the business, so that a moderate profit may be reaped from all, and the support of the road, and profits to its owners, not be exacted wholly or mainly from one portion of the business to the exemption of the remainder. But it is only when it is in that state that railroad companies are complying with their common law obligation as carriers. If they are sacrificing the interests of one class of shippers in the reckless strife to obtain the business of another, it is plain that they cannot be dealing impartially or making charges which are relatively just. And certainly no city can be interested in having the trade which is nearest to it, and which is the trade of the people constituting its best and largest customers, sacrificed to the trade with the people at a distance, who deal with it much less.

It is a fact of which the railroad companies are entitled to the full benefit, that the charges for railroad service have steadily declined, even when the railroads have been so conducted as to avoid competitive strife. Mr. Poor, in his summary of railroad operations for the year 1881, prepared for his *Manual*, gives some striking figures on the subject of rates, and shows that within a quarter of a century the average charges for the transportation of property on three of the great railroad lines of the country have been reduced more than 70 per cent., and that the reduction has continued to go on until the present day. Some of the reasons for reduction are traceable to competition, and some not. The growth of railroad business has kept pace with the reduction of charges upon transportation, and the two have acted and reacted upon each other as cause and effect. When the merchandise or products of one section of the country, for which there was a demand in another, would not bear transportation at existing rates, the railroads have been compelled to reduce the rates as a necessary condition to obtaining the property for carriage; and the reductions which are made in some cases from necessity are made in others from policy, because it is found that they stimulate industry, build up manufactures, and bring profits to the railroad companies in the great increase of business which is thereby prepared for them. In all these cases the common interest of railroad companies requires that they should yield to any public demand for the reduction of rates so long and so rapidly as they find they can do so with justice to their shareholders; and they have generally found that the net results were such as, from a selfish standpoint, would fully justify the reductions. Common understandings between railroad companies in many such cases might tend to equalize and steady the rates, but would be grossly impolitic and unreasonable if they were directed to the maintenance of such freight charges as would operate as a check upon transportation, and thereby reduce their own net revenues.

But there are influences bearing upon the charges for the transportation of property which are beyond the reach of the railroad companies altogether, and which no combination among them can control. The transportation of the products and merchandise which the different sections of the country exchange with each other is only in part in railroad hands, and the carrier's by rail are at all times subjected to a competition which is not only active and vigilant, but is possessed of some most important advantages. It will readily be inferred that we allude here to the carriers by water. For the whole distance from Chicago to New York the owners of boats on lake and canal are bidding against the railroads for freights. Much of the time they are offering rates which the railroads cannot meet without loss, and during the season of water carriage they would take away from the railroads nearly all the heavy freights, if it were not that the more rapid transit by rail has some advantages of which shippers find it for their interest in many cases to avail themselves. But even with these advantages the railroads find themselves compelled to make their charges approximate the charges of carriage by water, or the great bulk of heavy freights will inevitably take the water route. Thus the competition by water operates in reduction of railroad tariffs, and no understanding among railroad managers can prevent it. When the Erie Canal is closed for the winter the railroad companies are enabled to advance their charges; but even in the winter they feel the competition of the water route; for excessive charges will not be paid, but grain, flour, provisions and other heavy articles, instead of going forward by rail at what seem to shippers extortionate rates, will be placed in store until the water route is again open. Nor is the competition with the water route felt exclusively by the roads to

New York; for unless the seaports to the south afford better markets for Western products than is found at New York, which they seldom or never do, the roads leading to them will be cut off from carrrying these products if their charges are made to exceed the charges to New York. The favorable influence of the water route upon rates is therefore felt all the way to the Ohio and the Potomac, and the maximum of rates is fixed for all the roads by the roads to New York, with which the water route comes most directly and immediately into competition.

Under the competitive principle, a maximum of rates is thus established, and the railroad companies cannot prevent it, whatever may be their desire. But distance, cost, and many other circumstances may then come in to force still lower rates on the lines to the cities south of New York. If it is found that the roads leading to Baltimore will not obtain a reasonable share in the business without offering better rates than are given to New York, such rates will certainly be offered. They will submit to the rates which gives the business to other cities only until the trial proves the prejudicial operation. And when they reduce their charges, it will be optional to the New York roads to follow the Baltimore lead, and they may, no doubt, be relied upon to do so if their interests appear to require it.

But another most important factor in regulating freight charges is the export trade.

The prices of the leading American products, in the carriage of which the railroads compete most actively, are fixed in European markets. These products should net to the producer in the American market the foreign price, less reasonable charges for transportation and handling; and he is interested in having the trade open to the competition of as many buyers, and the transportation to that of as many carriers as possible. Of the Atlantic cities which compete for this trade, Baltimore and Philadelphia are dearest to the producer, but New York and Boston are nearest to the foreign market. Much is shipped to each of these cities for home consumption, but the major part of all that they receive is destined to a foreign market. Some of it passes from Western towns on through bills of lading to foreign ports, but the most of it is consigned to the merchants of the Atlantic cities, and is reshipped by them. Except at Boston, it has been found impracticable to distinguish between that intended for home consumption and that for foreign shipment; and, therefore, no discrimination in freight charges is attempted, but all is charged as if destined to a foreign market. But when so treated, the Atlantic cities become merely so many points on so many through routes between the interior of the country and the European ports, and the charges on shipments must regard the whole lines and not parts of them merely. On these several through lines, competing for the same business between the same interior American towns and the foreign ports, the whole charges, if the routes are equally favorable, must be substantially the same, or the one giving the best rates would obtain the business. The question of ocean rates must, therefore, have an important bearing on the inland rates; for if the ocean rates are greater from Baltimore to foreign ports than from New York to the same ports, the inland rates to Baltimore must necessarily be lower, or Baltimore will be excluded from the trade. Turning our attention, then, to the ocean freights, we find that during the year 1881, from Baltimore to Liverpool by steam and sail, they averaged nearly three cents per hundred pounds greater than from New York, and from Philadelphia nearly two cents greater. This is not conclusive of what they might be in another year, but it is indicative of a general condition of things. Besides this advantage in the ocean freights the New York route has a further advantage in the somewhat greater expedition. If, therefore, the railroads to Baltimore and Philadelphia were to charge for the inland carriage the same that is charged to New York, they must do so with the certain result of losing their present participation in the export trade. They must, therefore, of necessity, make their average inland rates at least as much lower than the inland rates to New York as will offset the differences in the ocean freights. This follows under the sway of competition from the same necessity which forces upon two merchants trading side by side in the same articles a concurrence in the same prices. Attempts by agreement or otherwise to counteract this law of competition would be of little avail, and of no avail, whatever, for any great length of time. All the leading articles of eastern bound freight would be affected by this principle and this would be so large a proportion of the whole as to govern the charges on all.

The differentials then appear to us to find their reason in competitive forces. A brief reference to their history will show that compact has not succeeded in controlling them. In 1869 there was an agreed difference in favor of Baltimore in the rates for the transportation of grain, of 10 cents per 100 lbs. But the effort to sustain this difference led to a war of rates, as a result of which it was reduced one-half. This lesser difference was maintained until 1876, when an agreement was entered into by the trunk line roads which based the rates on relative distances. But at the end of a month and a half the New York roads withdrew from this agreement, being satisfied that its operation was prejudicial to their interests. Then followed another war of rates, ending after a long struggle in the differentials now existing. The war of rates of 1880 was entered into to get rid of them, but it proved ineffectual, as before stated. They appear, therefore, to abide the tests of competition, and they have come, as prices generally do, under the exigencies of trade.

But it is, of course, possible that differentials may be just at one time and unjust at another; and it is insisted on behalf of New York that, whatever may have been the case heretofore, the existing differentials are no longer just to that city, and are no longer such as would result from a competition not hampered and restrained by railroad combinations. For evidence of the injustice, we are referred to statistics which show that the growth of Baltimore and Philadelphia trade, especially in grain and provisions, has in late years gained rapidly on that of New York. This, it is said, is proof that the differentials operate against New York interests, and the New York roads ought to abolish them by reducing their own rates until they conform to the rates on the lines leading to Baltimore and Philadelphia. This, it is insisted, is what fair competition requires.

It might, perhaps, be a sufficient answer to this demand, that the attempts heretofore made to force equality of charges, though long persisted in, with no small loss to the participants, proved unavailing. But passing that fact without further remark, we direct our attentiou to the evidences that New York has suffered from the differentials. These we have not found of much weight. It is certainly true that Baltimore and Philadelphia have now a larger share in the grain and provision traffic than they had fifteen years ago; but it remains to connect the fact with the existence of the differentials. For a long time New York nearly monopolized that trade; but the reasons were obvious in its better channels of commnnication with the interior, and its greater preparations to accommodate it. When Baltimore and Philadelphia had extended their railroad systems so as to compete for the trade, and had provided elevators and other conveniences, they immediately took a share in the business; not because of the differentials, but because they were then prepared for it. But no evidences were produced before us that the Philadelphia and Baltimore business, to which the differentials are applicable, is now increasing more rapidly in proportion than that of New York, or that the growth of New York business is, to any extent, checked by them. On the contrary, there is abundant evidence that New York is fully maintaining its present lead, and that its trade is enjoying a growth so healthy and vigorous, that its commercial classes can well afford to regard, without envy or regret, the prosperity of other places, and may well concede to them, without repining, all the advantages which have come to them as a result of competitive efforts. The accompanying note will show the relative proportion of the total receipts of grain and flour at the four Atlantic ports which was received at each, and it will appear from the figures, that New York, during the last eighteen months, has gained on the others.* How far ephemeral causes have contributed to this gain we can not know, but it is manifest that the evidence that New York suffers from differentials does not yet appear.

As the interior is interested in the subject of differential rates, and as the sharpest competition in freights is encountered there, so that its commercial classes are in favorable position to judge of the forces affecting them, it has seemed to us no weak evidence of the justice and necessity of the differentials that the preponderating sentiment in the interior was strong, and decided that the differentials were just. There was, indeed, some dissent, but this was the prevailing view.

In our discussion thus far, we have had but little to say of the case of Boston, or of the westward-bound freights. As to the latter, some of the considerations above mentioned would not apply, but the differences are not sufficient, as we think, to relieve New York westward-bound freights from the differentials. We were not invited by the commercial organizations of Boston to visit that city, and we refrained for that reason from doing so. We have reason to suppose that the seeming want of interest in Boston in the subject referred to us was due to the fact, that no one seemed disposed to make any controversy in respect to the rates to that city. Boston claims the same rates with New York on the export trade, and the other cities do not appear inclined to contest the claim. This makes the charges less on foreign-bound freights than upon those delivered in Boston and other New England towns for home consumption; and to that extent works an apparent injustice. If the low charges on foreign-bound goods have the effect to increase the charges on freights for home consumption, it is an injustice in fact; but if not, and the Boston roads consent to carry at the low rates as a necessary condition to participation in the foreign trade, the other cities cannot well contest their right to do so. As the ocean freights from Boston correspond very closely to those from New York, the principal already stated is applicable; and we have no occasion to consider the case of Boston separately.

	1878.	1879.	1880.	1881.	6 mo. 1882
New York	56.	52.6	53.5	56.5	62.9
Boston	10.	10.6	11.7	14.3	10.8
Philadelphia	16.7	15.3	15.6	11.7	11.6
Baltimore	17.3	21.5	19.2	17.5	8.7
Total	100.	100.	100.	100.	100.

CONCLUSION.

It only remains for us to state that no evidence has been offered before us that the existing differentials are unjust, or that they operate to the prejudice of either of the Atlantic seaport cities. Differential rates have come into existence under the operation of competitive forces; they bear some relation to relative distance and relative cost of service; they recognize, as we think, the relative advantages of the several seaports; and they are subordinate to the great principle which compels the carriers of property competing between the same points and offering equal facilities to their customers, to make the same rates. We therefore cannot advise their being disturbed.

But we do not assume that the rates which are just to-day will be just indefinitely. They have become established by the force of circumstances, and they ought to give way if future circumstances shall be such as to render it right and proper. They constitute a temporary arrangement only; equitable, as we think, for the present, but which may become inequitable before the lapse of any considerable time. Whenever they shall be found to operate unfairly, and give a forced and unnatural direction to trade, and whenever it shall appear that they tend to deprive any one of the seaports affected by them of the proportion of business that would naturally come to it under the operation of normal competition, the want of equity in the rates will appear, and it will be right to modify, or, perhaps abolish them.

Railroad problems assume such different phases from year to year, and almost from day to day, that those who have authority in railroad matters may justly be expected and required to give their earnest attention and best efforts to making their franchises accomplish the great ends of equal, fair, prompt and beneficial accommodation which was intended in their grant. And those ends they should have in view in determining upon the continued existence of differential rates. Their observation of the general course of traffic from day to day and from month to month ought to enable them to determine whether the differentials are too large or too small; whether they are influencing trade unfairly and unnaturally, and whether they operate as an improper restraint upon competition, and when the improper effect is discovered they ought to correct the wrong without hesitation or delay. To enable them to judge fairly and with full understanding, accurate statistics of their business should be kept by each of them, and submitted to the others or kept in some common office, and these statistics ought to be periodically given to the public also. Publicity is a great corrector of imaginary evils, and may be an important preventive of evils, both imaginary and real.

We do not assume or believe that there exists in railroad official circles any legitimate authority to determine the question of rates arbitrarily. Large powers of self-government have, undoubtedly, been left by the law in railroad managers, but all their authority is qualified by duty to the public; and it cannot be too often or too pointedly asserted that the obligation on their part to serve the public with relative fairness is of perpetual force. In their future dealings with the important question which has been the occasion for our coming together, the great trunk lines should be particularly careful to give no occasion for just complaint, that they subject any one of the seaboard cities to the operation of arbitrary or unfair regulations or charges, or that they fail to observe towards any of them, or towards the people trading or desiring to trade with them, the mandate of the common law—to deal justly and distribute fairly the benefits and burdens which are incident to their occupation.

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THOMAS M. COOLEY.

NEW YORK, July 20, 1882.

THE COLUMBUS & EASTERN RAILROAD COMPANY has the engineers at work making the locating survey from Columbus to a new and undveloped mineral field in the eastern part of Berry County. The syndicate, on which the railroad enterprise is based, has optioned about thirty thousand acres of mineral lands, rich in coal, iron ores, fire and potter's clay, and the directors propose to have the cars running from Columbus to Selby's Pass, a point three miles northeast of New Lexington, by the 1st of next January. The mineral field to be made accessible by the construction of this road is second to none in the state.